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Risk Factors Associated with Compromised Birth Outcomes Among Mexican Origin Population in El Paso, Texas. A Postpartum Hospital Study.

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Risk Factors Associated with Compromised Birth Outcomes Among Mexican Origin Population in El Paso, Texas. A Postpartum Hospital Study.

by

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Dedication

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por su apoyo incondicional y comprensión,
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Risk Factors Associated with Compromised Birth Outcomes Among Mexican Origin Population in El Paso, Texas. A Postpartum Hospital Study.

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This dissertation examines compromised birth outcomes among Mexican Americans and Mexican women who delivered infants at Thomason Hospital in El Paso, Texas, using a survey that was carried out between 1995 and 1997. Sociodemographic, behavior, and biomedical variables are included to study the birth outcomes. Descriptive analyses and multinomial logistic regression are used to analyze the data. Mexican-Americans were more likely to deliver preterm infants (light or heavy), while they showed no differences with Mexican-born women regarding IUGR infants. The disadvantage of Mexican-American women remains, even after controlling for their higher level of education and advantages regarding some other characteristics. It is worth noting that they showed a higher proportion of smoking and drinking. One of the key variables that explain the differences is that Mexican-Americans have a higher percentage of women becoming a mother at ages younger than 20 years old.

Table of Contents

List of Tables

List of Maps

Chapter 1: Introduction

This dissertation is an investigation of ethnicity, acculturation, various risk factors, and birth outcomes among Mexican-origin women along the U.S.-Mexico border in Texas. It includes a review of the Hispanic epidemiologic paradox, a sociological conceptualization of ethnicity and acculturation in a U.S. border city, and a framework that delineates sociodemographic, behavioral, and biomedical factors that help explain the association between acculturation and compromised birth outcomes for Mexican-origin women. The analysis uses data from a large hospital in El Paso, Texas, to analyze the extent to which, and why, there are birth outcome disparities across women from different levels of acculturation to the United States.

Birth outcomes are an excellent marker for the infant's health as well as his or her survival probabilities and subsequent child health. The health of new born babies is the subject of numerous empirical studies because of their strong associations with infant mortality (neonatal and post-neonatal), congenital anomalies, and later child outcomes, such as developmental delays, disabilities, attention-deficit/hyperactivity disorder and poor educational achievement (Albrecht, et al. 1996; Thompson et al. 2003; Bhutta et al. 2002).

Many studies in the United States have addressed health disparities of the population across numerous sociological factors, including sociodemographic and socioeconomic variables. Race/ethnicity is one of those important variables. This socially constructed variable is based mainly on the country of birth, country of

birth of the mother, skin color, and even surname (Forbes and Frisbie, 1991; Fuentes-Afflick et al. 1997; Palloni and Morenoff, 2001; Hummer, 1993; Scribner, 1996; Palloni and Arias, 2004). The birth outcomes literature usually separates the White (also called non-Hispanics Whites), African-American, Hispanic, Asian-American, and Native-American populations. Most often, studies compare these groups across one or more aspects of their health status, using sociodemographic and socioeconomic variables as explanatory factors. Nativity, or birth place of the mother, is also often taken into account (Hummer et al. 1999; Singh and Yu, 1996). For example, it has been shown that infant mortality is higher among women who have a lower socioeconomic status (Finch, 2003); similar results have been found with the overall health status of the population.

When compared with other Latino subgroups in the United States, low birth weight (LBW) rates for Mexican mothers are similar to those from Central/South America and Cubans, as well as non-Hispanic whites, but Puerto Ricans have consistently higher levels of low birth weight; even when controlling by age and by marital status, Mexican women have lower risk of LBW than Puerto Ricans. The high percentage of unmarried women among Puerto Ricans increases their chances of having a LBW infant (Fuentes-Afflick and Lurie, 1997).

In the last three decades, literature on what now is known as the Hispanic epidemiologic paradox has been an important subset of this body of work. In general, it states that the Hispanic population has a lower infant mortality rate than non-Hispanic Whites despite having an overall low socioeconomic status profile and less access to health care than the majority population (Forbes and Frisbie, 1991; Frisbie et al. 1996; Palloni and Morenoff, 2001). Some studies have shown that this pattern is also valid for adult mortality (Hummer et al. 2000;

Sorlie et al. 1993). Further, similar more positive-than-expected health outcomes have been found in the population for weight at birth. In general, Hispanic mothers, especially those who are Mexican-origin, have a similar percentage of compromised infants as non-Hispanic Whites (Frisbie et al. 1996; Frisbie and Song, 2003; Balcazar et al. 1991; Chung et al. 2003; Fuentes-Afflick et al. 1997; Fuentes-Afflick et al. 1999). Moreover, some studies have shown that, within ethnic groups, foreign-born women have better outcomes than U.S.-born women (Kelaher and Jessop, 2002; Singh and Yu, 1996). This latter portion of the epidemiologic paradox –the more favorable outcomes among the foreign born- is one of the key health patterns fueling this dissertation work. Why is this the case? How do women of the same ethnic group have different outcomes based on whether or not they are foreign-born or native-born?

Thus, it is important to identify differences within a specific group and the risk factors associated with their differential birth outcomes. In this dissertation, I focus on Mexican-origin mothers who delivered their infants in a U.S. hospital at a large border city in Texas. I focus on their sociodemographic and biomedical characteristics, as well as their behavior during pregnancy and the financial support that they received from government agencies, to explain differences in birth outcomes between Mexican-born and Mexican-American mothers. I will further look at subgroups within the Mexican-born women, to try and determine if there are birth weight differences depending on the acculturation status of these women in the United States. A survey was especially designed by Dr. Joseph E. Potter, Irene Casique (graduate student) and Raul S. Gonzalez (graduate student) from the Population Research Center of The University of Texas at Austin to obtain all that information; it included questionnaires in both English and Spanish.

1.1. The Significance of Birth Outcomes

In 1950, the World Health Organization (WHO) designated births of less than 2,500 grams as a standard for 'prematurity'. In the literature concerning infant weight, this limit has been established as a critical value for new babies and their chances of survival, so most research on birth outcomes focuses on birth weight, and examines the factors that have influences on it. By itself, the infant's weight is the most important predictive factor for infant survival probabilities, which explains the substantial amount of attention given to it. Low-birth-weight babies have a higher risk of infant mortality; approximately 20 times that of normal-weight newborns (MacDorman and Atkinson, 1999; Boardman, et al. 2002), and those who survive low weight are at greater risk for health and development problems during childhood (Hack et al. 1995).

Among the factors that affect the risk of low birth weight, they are often classified as socioeconomic, sociodemographic, behavioral, and biomedical. These variables do not act alone, as their effects are related in many ways. While some of them apparently have the same effect across ethnic groups, others seem to have distinct effects by ethnicity. For instance, it has been hypothesized that prenatal care may have a different -less important- effect for Hispanic women than for women in other ethnic groups on pregnancy outcomes (Frisbie et al. 1996).

Low birth weight may be caused by intrauterine growth retardation, by short gestation, or both. Infants who born with less than 37 weeks' completed gestation are considered to be short gestation (Frisbie et al. 1997). Prematurity and intrauterine growth retardation can be the result of different factors. Low birth weight outcomes can be divided into two categories: premature births (less than 37 weeks' gestation and weight less than 2,500 grams), and intrauterine growth-

retarded birth (37 or more weeks' gestation and weight less than 2,500 grams). A combination of birth weight and gestational length has also been used to classify birth outcomes. Yerushalmy (1967) proposed a classification that separated birth outcomes into 5 categories that included cuts at 1,500 grams of birth weight, 2,500 grams of birth weight, and 37 weeks of gestation. The first group included all births that weighed 1,500 grams or less, without regard to gestational length; the other four categories were divided using 2,500 grams and 37 weeks as critical points. Frisbie et al. (1996) used these last four categories, but also included another criteria to classify birth outcomes: the fetal growth ratio (FGR). The FGR is defined as the ratio of the observed birth weight at a given gestational age to the mean birth weight for gestational age of a sex-specific fetal growth distribution. The critical value for this ratio was 0.85 to determine maturity. Under this scheme, 8 categories can be found; however, two of them were dropped because of very small probability of incidence: those babies with low birth weight, 37 weeks or more of gestation, and FGR greater of equal to 0.85; and those with normal weight, a ratio greater or equal to 0.85, but with less than 37 weeks of gestation. For this dissertation, I will use a simpler classification, using only four categories based on gestational length and birth weight. This is simply because of the relatively small number of low weight and short gestation births that are available in the data set to be used.

1.2. The Significance of the U.S.-Mexico Border

The border can be defined as a line, socially-defined or natural, that separates two nations. Its essential function is to "keep people in their own space and to prevent, control, or regulate interactions among them" (Martinez, 1994, p. 5). Between Mexico and the United States, the border is represented by a socially-

created line[1] from Tijuana, Baja California - San Diego, California, to Juárez, Chihuahua - El Paso, Texas, and by a river (named Rio Bravo on the Mexican side, and Rio Grande on the U.S. side) from there to Matamoros, Tamaulipas - Brownsville, Texas.

The U.S.-Mexico border region offers a unique opportunity to study diverse social, economic, environmental, and health issues. It is the only border between a developed country and another in the process of development which results in a large variety of interactions among their populations. This area has been the principal context for several studies concerning its economic development, demography, social movements, and environmental issues. This particular region has produced international interactions between individuals of different nationalities, much economic development, mixed customs and cultures, and differential power relationships (Bustamante, 1989). Individuals interact on both sides of the border, by crossing it in order to satisfy their interests or necessities, to obtain goods and/or services from the other side, to find lower prices on different products, and to seek employment. Residents of one country often go to the other side of the border looking for something that they can probably obtain on their own side, but sometimes they try to maximize certain aspects of the product or service. Because of these factors, the border region has become an important area for social and health-related research (Power and Byrd, 1998; Potter et al. 2003; Garza et al. 2004).

The population in the border region on the U.S.-Mexico border is basically urban (areas with 2,500 or more inhabitants): according to figures from the 2000 Mexican census, 93% of border residents on the Mexico side were living in urban

[1] Although there is a metal fence that stretches several miles between neighboring cities where there is no river, the official border is about 3 feet south of that fence.

areas (INEGI, 2001). On the United States side, 88.3% were living in urban areas[2]. The border population is also organized in many pairs of cities (San Diego and Tijuana, Calexico and Mexicali, El Paso and Ciudad Juárez, Laredo and Nuevo Laredo, McAllen and Reynosa, Brownsville and Matamoros), where policies and decisions should be made taking account whatever is considered most beneficial on both sides. However, these dual cities do not often make join decisions.

Not all the people residing in these dual cities have actual interactions with their counterparts on the other side of the border; for instance, half of the population in Tijuana cannot cross the border into the United States due to a lack of proper documents (Alegría, 2000). This implies that despite the geographic proximity of the two countries, there is not always a good comprehension of the social structure of the other country and interests are always not shared.

However, for those who can and do cross the border, a whole world of possibilities can open up. An example of such is the process, not rare, where Mexican women cross the border --either legally or without proper documents-- in order to receive prenatal care and/or to deliver their babies in a hospital in the United States. The reasons for doing so may vary from one couple (or a single woman) to another, such as looking for better medical facilities, but almost invariably the main reason is to obtain U.S. citizenship for the new born. Guendelman and Jasis (1992) found that cross-border health care utilization is relevant due mainly to large numbers of Tijuana residents who seek prenatal care attention in San Diego, not only for citizenship for the new born, but also because they were offered better technology or attention, including being treated with greater respect. Just a small proportion reported that they wanted special benefits,

[2] U.S. Census Bureau, County and City Book 2000: www.census.gov/prod/www/ccdb.html.

such as government aid. Thus, studying the composition and characteristics of the women who give birth in the border region can provide an important lens through which this area can be better understood.

The Texas part of the border with Mexico is quite different from the California part in terms of racial/ethnic composition. In San Diego, California, only 26.7% of the population is of Hispanic origin (as defined in the Census 2000, of the U.S. Census Bureau), while in El Paso, Texas, this proportion increases to 78.2% (see Table 1-1).

Table 1-1: Population of El Paso County, Texas, and San Diego County, California, by Hispanic Origin, 2000.

County	El Paso	Percent	San Diego	Percent
Total	679,622	100	2,813,833	100
Hispanics (all origin)	531,654	78.2	750,965	26.7
Hispanics of Mexican Origin	447,065	84.1*	628,460	83.7*
Non-Hispanics	147, 968	21.8	2,062,868	73.3

* Percent with respect to all Hispanics
Source: U.S. Census Bureau, Census 2000.

One important aspect, not surprising, is that the majority of the Hispanic population at the border is of Mexican origin, around 84% in both counties. With respect to the total population, the Mexican origin population in El Paso accounts for about 2/3 of the total population, while in San Diego they represent only 22%.

1.3. Specific Aims and Organization of the Dissertation

Give the above introduction, it is clear that it is important to study birth outcomes among Mexican-origin women in the United States and that the border

region represents an interesting context in which to do so. Following that, the specific aims of this dissertation are to:

1) Describe the birth outcome differentials of Mexican and Mexican American women who give birth at Thomason Hospital in El Paso, Texas, paying particular attention to acculturation differences among women of Mexican descent.

2) Analyze differences in birth outcomes in terms of weight and gestational age, by mother's nationality/acculturation, while controlling for sociodemographic characteristics, such as age of the mother, education, and participation in the labor force.

3) Estimate the differences in birth outcomes by nationality/acculturation while considering social support characteristics, such as marital status, family structure, and receipt of government aid.

4) Explore other determinants, such as biomedical and behavioral variables, for their influence on the association between nativity/acculturation and adverse birth outcomes. Smoking, drinking, adequate prenatal care, weight gain during the pregnancy, parity, and loss history are among the factors that will be examined here.

To do so, I use data from the Thomason Hospital Birth Outcomes and Reproductive Health Survey (www.panam.edu/dept/tmbhco/UTAustin.pdf), which contains information from 5,076 postpartum women who had recently delivered a live birth between April 1995 and March 1997.

The dissertation is organized in the following manner: Chapter 2 provides a review of the literature and summarizes the unique contributions of this dissertation to the research literature. Chapter 3 presents a conceptual framework to analyze the birth outcomes of Mexican-origin women who delivered at Thomason Hospital in El Paso, Texas, using nativity and language as key markers of differentiation among this population. Chapter 4 presents the data and the measures as well as the methods that will be used in this dissertation. In chapter 5, descriptive analyses are presented. Chapter 6 includes logistic regression models that will help to determine the relationship between nativity and acculturation with compromised birth outcomes, taking into account the other explanatory factors. Finally, in chapter 7, conclusions are presented. A review of the findings is included, along with the limitations, next steps, and policy implications of this project.

Chapter 2: Literature Review

According to the U.S. Census Bureau, individuals of Hispanic or Latino origin were the largest minority group in the country, comprising 12.5% of the population, in contrast with 12.3% for Blacks or African Americans (Grieco and Cassidy, 2001). By the year 2002, there were about 37.4 million persons of Hispanic origin, approximately two-thirds of whom were of Mexican origin (Ramirez and de la Cruz, 2003). That totals approximately 25 million persons of Mexican origin alone. This data establishes the numerical significance for analyzing this population and its health outcomes.

2.1. Mexican-American Birth Outcomes

Many studies have identified variations in birth outcomes among different ethnic groups, although such differences are not always in the expected manner. Despite their apparent socioeconomic disadvantages, Mexican immigrants in the United States have a more favorable pattern of birth outcomes than Mexican-American and Non-Hispanic White women. This situation is described in the literature as an epidemiologic paradox, and has been analyzed and documented by several researchers in diverse disciplines, such as sociology and demography (for example, see Forbes and Frisbie, 1991; Frisbie et al. 1996), and medicine and public health (Vega and Amaro, 1994; Markides and Coreil, 1986; Scribner and Dwyer, 1989; de la Rosa, 2002).

The Hispanic epidemiologic paradox seems to occur all around the United States. Studies concerning birth outcomes and race/ethnicity on both the national and local level show that Hispanic women, especially the Mexican-origin population, as a group have low socioeconomic status, similar to the African-American population, but lower mortality levels and better birth outcomes than

those presented by non-Hispanic Whites (Callister and Birkhead, 2002; Cervantes et al. 1999; Chung et atl, 2003; Cohen et al. 1993; de la Rosa, 2002; Franzini et al. 2001; Palloni and Morenoff, 2001; Frisbie and Song, 2003; Scribner, 1996). Even more, Hispanics also have an overall lower education level than both African-Americans and non-Hispanic Whites, and have less health insurance as a group than any other racial-ethnic group (Franzini et al. 2001; Hessol et al. 2000). Further, their use of prenatal care is low in comparison with other ethnic groups (Echevarria and Frisbie, 2001; Chung et al. 2003). Also, positive attitudes toward pregnancy seem to be associated with better birth outcomes; such attitudes seem to be more common in the Mexican-origin population than the African-American population (Zambrana et al. 1999).

In a study in San Diego with immigrant women (mainly from Mexico and Asia), a set of sociocultural factors and biomedical determinants were studied. Foreign born women were characterized by favorable birth outcomes, despite a high risk profile. The authors conclude that immigrant women are indeed 'superior health achievers,' and that accounts for at least some part of their more-positive-than-expected perinatal outcomes (Rumbaut and Weeks, 1996).

As mentioned before, infants of Mexican-origin mothers have a low prevalence of compromised birth outcomes, such as low birth weight. During the period of 1980-1997 the Mexican-origin population was characterized by low levels of LBW, with values ranging between 6.1% and 6.5%, in contrast to 5.7% to 6.5% for non-Hispanics Whites, and 12.7% to 13.5% for non-Hispanics Blacks (Palloni and Moreoff, 2001). To explain this paradox, several possible explanations have been offered, for which three major hypothesis are either implicit or explicit in many of those studies. One is that Mexican traditions/culture acts as a protective agent during pregnancy; the second is that

those women of Mexican-origin come to the U.S. as part of a selective process, since only the more healthy and motivated can successfully emigrate to the United States. The third major hypothesis is the 'Salmon Bias', which states that Hispanic-origin persons tend to return to their birth countries, so data on key items are not registered in the U.S. statistics system (Abraido-Lanza et al. 1999; Franzini et al. 2001). Also, it has been argued that the quality of the data involved in many of these studies are weak in some aspects, such as the identification of the true onset of the pregnancy in calculating gestational length (Balcazar, 1994; de la Rosa, 2002). Gestational diabetes, which is more common among Mexican-origin women, is also associated with higher birth weights and may differentially impact birth outcomes (Buekens et al. 2000; Balcazar, 1994). All told, however, there are interesting differences across groups in the United States that do not always favor the more highly educated, wealthy populations. Such enigmas remain the topic of investigation.

2.2. Birth outcomes, the Mexican-origin population, and Acculturation

Acculturation can be defined as "a process of cultural transition that is intertwined with social network transitions and socio-economic transitions for immigrants and their offspring" (Rogler, 1994). Cultural differences seem to be one of the preferred explanations for the epidemiological paradox; it is argued that Mexican culture contains norms and ideas that favor positive health outcomes (de la Rosa, 2002; Palloni and Morenoff, 2001). Such norms and ideas may be related to a lifestyle and values more highly oriented to motherhood, and that also have protective effects on pregnancy. This idea has led to the incorporation of the mother's acculturation as an important determinant of pregnancy outcome in several studies (Scribner and Dwyer, 1989; Zambrana et al. 1997; Laganá, 2003; Cobas et al. 1996; Balcazar et al. 1991; Balcazar et al. 2001; Callister and Birkhead, 2002). Mexican and Mexican-American women, as a group, smoke less

and drink less, and even have a better diet than non-Hispanic whites (Fuentes Afflick and Lurie, 1997; Cobas et al. 1996; Balcazar et al. 2001; de la Rosa, 2002).

Furthermore, the acculturation process – or the loss of such protection for women who are more acculturated to the United States -- seems to lead to behaviors during the pregnancy that are more adverse for the fetus. As women become more and more acculturated to the U.S., their behavior seems to become more risky, because not only do they tend to smoke more frequently and drink alcohol more often, but they also engage in activities associated with adverse birth outcomes, like substance abuse and personal violence (Scribner, 1996; Callister and Birkhead, 2002; Coonrod et al. 2004). Time of residence is also important in the process of acculturation, and hence, the chances of delivering a LBW infant seems to increase for Mexican-origin women with increased time spent in the United States (Crump et al. 1999).

Social support networks for the newly arrived to the country are also a part of the Mexican culture. Even when Mexican women have no relatives at the new place of residence, their communities usually act like a pseudo-family, increasing the social support network (Franzini et al. 2001). Nevertheless, less acculturated women also present some behaviors that can be seen as risky regarding low birth weight. For example, Mexican-origin women are less likely to seek receive adequate prenatal care (Balcazar et al. 1991). In an ethnographic study, 'biculturalism' was proposed to diminish low birth weight, by promoting social support networks, as in Mexican culture, and routine prenatal care, which is more pronounced on the U. S. side of the border (Laganá, 2003).

However, 'acculturation', even when defined as a process that implies several stages, and which takes place for more than one generation, is very hard to measure[3]. Besides self-declared ethnicity and/or of the parents, many authors have used language (either spoken, read, or written) as part of an indicator of acculturation (Coonrod et al. 2004). Cobas et al. (1996) concluded that acculturation, measured through language, has an important effect on low birth weight status such that Mexican immigrants invariably present lower values of acculturation than Mexican Americans, who in turn have a higher percentage of LBW infants (Zambrana et al. 1997). Puerto Ricans of recent immigration to the mainland U.S. also showed that use of Spanish language is an important protective factor against infant mortality when compared to mainland-born Puerto Ricans (Landale et al. 2000).

In conclusion, although there is not one certain form of measurement for the level of acculturation among the Mexican-origin population, there is evidence of a cultural effect that is usually present, which may be a key factor in understanding the epidemiologic paradox. At the same time, there have been no studies along the Texas-Mexico border that has analyzed these effects.

2.3. Birth outcomes, the Mexican-origin Population, and Selectivity

Not all Mexican persons have the same probability to migrate to the United States. There is likely a selection of migrants, perhaps favoring those whose health condition are better than the people who do not migrate (Palloni and Moreoff, 2001; de la Rosa, 2001). Moreover, among those who successfully migrate, there is another implicit selection, since not all of them stay in the United

[3] An index was designed by Cuellar et al. (1980). English language preference, literacy in English, time of residence, education, mother and father identification as Mexican, and literacy in Spanish are included among the principal factors (Cited by Zambrana et al. 1997).

States for large amounts of time. However, as stated before, as they live longer in the United States, there tends to be acculturation, and higher LBW rates.

For example, Puerto Rican women that recently moved to the United States from the island showed better health outcomes and lower mortality rates than the Puerto Rican-origin population who were born in the mainland U.S., even when demographic and socioeconomic controls were implemented. An explanation for this includes better general health, resourcefulness, and motivation to succeed among new migrants (Landale et al. 2000).

Place of destination for the migrant women is not random. They usually migrate to areas where there they already have networks that can help them to get established (Durand and Massey, 1992). These networks usually provide not only shelter and food for the recently arrived, but also information that helps facilitate life in the U.S. (Palloni and Morenoff, 2001). In the event of a pregnancy, the network could become significant for support since, as stated before, pregnancy is highly valued in Mexican culture.

One important aspect of the selectivity of migrants is the socioeconomic background when they decide to migrate. Over the past decades, migration from Mexico to the United States was mainly single young men from rural areas with little or no education who were looking for a job in the American fields as farm workers. Through time, the profile of the migrant has changed dramatically: now, women have increased significantly their presence among migrants, both documented and non-documented, and their profile includes more education. A sizable proportion are married and migrate with their husbands. Further, their jobs are usually in the urban/tertiary sector (Marcelli and Cornelius, 2001; Durand et al. 2001; Durand and Massey, 1992).

In conclusion, there is evidence that shows that recent migration is selective in terms of health conditions and that has its influence on birth outcomes, either through the mother's own characteristics and/or cultural background. It is clear that aspects of both selectivity and acculturation need to be considered when examining birth outcomes among Mexican origin women. The next section looks at specific studies along the border that have considered such factors.

2.4. The U.S.-Mexico Border and Birth Outcomes

The population on both sides of the U.S.-Mexico border often cross to the other side to obtain goods and services that are easier, cheaper, or better, including some things that are not legal, on their own side. For example, youths older than 18 years old usually cross to Mexico in order to buy alcoholic drinks, which they cannot legally buy in the United States. In contrast, many Mexican women cross the border in order to get an abortion, which is not legal in Mexico[4] but is legal in California (Ojeda et al. 2003). Also, many people living in the United States look for medical services on the Mexican side, because services are in Spanish, for those who speak the language. Further, they tend to buy some medicines on the Mexican side that are available over the counter, like antibiotics and/or contraceptives (Parietti et al. 1998).

For maternal health services, it is common for Mexican women to cross the border in order to deliver a baby in a U.S. hospital. They would have more than one reason, but the main purpose is to provide U.S. nationality for the infant (Guendelman and Jasis, 1992).

[4] Abortion is legal in Mexico only in the case of rape, when the life of the mother is at high risk, and when the pregnancy is the result of an incestuous relation.

Also, they usually receive more specialized and more integrated services for their pregnancy, sometimes by paying with their own money (Guendelman and Jasis, 1992; Weeks et al. 1999; Vázquez and Cueva, 2001).

There are just a few articles that deal with birth outcomes in the U.S.-Mexico border area. Weeks et al. (1999) compared Mexican women in San Diego and their birth outcomes, with Mexican women in Tijuana and their birth outcomes. They also included U.S.-born Latinas and U.S.-born non-Latina whites. The data for Tijuana came from a survey undertaken at the Hospital de Gineco-Obstetricia del IMSS, a government institute that provides health services to workers from the private sector. The database consisted of 1878 women who delivered a baby at that hospital; data from San Diego came from the Comprehensive Perinatal Program at the Medical Center of the University of California in San Diego, whose database included 1431 singleton births to women born in Mexico, 79 U.S.-born Latinas, 259 U.S.-born non Latina whites, and 49 foreign born non-Latina whites. The aim was to compare women giving birth in Tijuana with women from Tijuana giving birth in San Diego and see if there were differences in their pregnancy outcome. These authors found that the Mexico-born women in San Diego delivered the fewest infants with low birth weight (2.9%) compared to women in Tijuana (4.9%). This finding seems to concur with the hypothesis of selective migration.

In the same study, after controlling for variables such as previous infant deaths and miscarriages, the authors concluded that the women in Tijuana were expected to have the best birth outcomes of any ethnic/immigrant groups; thus, is not surprising that Mexico-born women in San Diego have better birth outcomes. However, they also concluded that U.S.-born women of Mexican ethnicity were not able to maintain the favorable health outcomes, supporting the idea that

Mexican-American tend to lose their health advantage as they become more acculturated to the U.S. Notably, women in Tijuana were the group with the least smoking/alcohol drinking and/or use of drugs.

Another important finding in the San Diego study is that the women who delivered their babies in Tijuana were the least likely group to receive adequate prenatal care, yet they had better birth outcomes. Also, women in Tijuana were the group that had fewer stillbirths or miscarriages, which is also related to compromised birth outcomes. It is also interesting that education of the women was not a relevant factor, because women born in Mexico had fewer years of education compared to the U.S.-born women.

English et al. (1997) reported similar findings for Central California. These authors examined low birth weight for 4404 Mexican-origin women. They incorporated both language spoken at home and nativity as proxies for acculturation. Their findings are very interesting, because they show that it is not only the country of birth of the mother, but language use at home that is related to LBW. Mothers who were born in the U.S. who speak Spanish are at the highest risk for low birth weight, while Mexican-born women who speak English at home have the best birth outcomes. They argued that Mexican-American women of second generation that spoke Spanish at home tend to adopt risk behaviors, such as non-marital births, smoking and so on that are related to higher risk.

In summary, as stated before, it is important to analyze low birth weight among the Mexican-origin population, based on country of birth and language spoken at home. The border offers a unique perspective to do it. This dissertation adds to the border health literature and the epidemiologic paradox literature more generally, because:

a) It focuses on a Texas border city, which has not done before. The San Diego study is an important reference, but the conditions in El Paso are very different in terms of the concentration of Mexican-Americans, poverty, and more.

b) The data were collected right after the women gave birth. Most of the data sets used to analyze the epidemiologic paradox are based on official registers.

c) The acculturation process could be different at the border, because of the proximity to Mexico.

d) Selectivity is embedded in the migration process. Although it is not possible to know for sure whether the women at the Thomason Hospital were residing in the U.S. or not, many women were probably living in Ciudad Juárez, Chihuahua. If so, they have not migrated to the U.S., but are only undergoing a short stay in El Paso. In any case, there is most likely also selectivity among those women who cross the border to deliver a new infant[5].

[5] The exact proportion of women who cross the border to deliver a new infant is unknown, because the women may not have correctly answered their place of residence. For an estimation of this proportion, see Potter et al., 2003.

Chapter 3: Conceptual Framework

Several factors have been studied as risk factors for low birth weight and/or small-for-gestation-age outcomes. In general, they include race and/or ethnicity, sociodemographic variables, maternal health conditions, behavior prior to and during the pregnancy, and maternal health variables. In this chapter I present a conceptual framework to analyze the birth outcomes of Mexican-origin women in Thomason Hospital in El Paso, Texas. First, I discuss nativity and language as categories of analysis, then I present four sets of risk factors that reflect proximate determinants of compromised birth outcomes: sociodemographic, income support, behavioral, and biomedical factors. Finally, I discuss the categories of birth outcomes that are considered in this dissertation.

3.1. Nativity and Language

As I have discussed previously, the mother's birthplace and language seem to be associated with birth outcomes. Infants whose mothers were born in Mexico present lower rates of low birth weight than Mexican-American women's infants. Previous studies have also used this classification with relevant results. English et al. (1997) concluded that Mexico-born nativity status is a significant protective factor against low birth weight. Singh and Yu (1996) established that maternal nativity status among Mexican-origin women may serve as an important axis of differentiation for birth outcomes. Crump et al. (1999) found that U.S.-born Mexican-American women in Washington State had a higher risk of preterm birth than Mexico-born women. Similar findings can be extracted from the studies by Scribner and Dwyer (1989) and by Weeks et al. (1999). For this reason, it is important to classify women according to their place of birth, Mexico or the United States. For this dissertation, women will be divided into Mexicans (born in Mexico) and Mexican-Americans (born in the United States).

Similarly, less acculturated Mexican-origin women who live in the United States present fewer compromised birth outcomes, with language an important component of acculturation (Cobas et al. 1996; Scribner and Dwyer, 1989). English et al. (1997) found that Mexican-born mothers that spoke English had lower rates of low birth outcomes than those who spoke Spanish. In contrast, Landale et al. (2000) concluded that, for Puerto Ricans, use of Spanish language is an important protective factor against infant mortality for those women with little education. These studies mark the importance of using language among foreign born mothers as a key variable for acculturation in studying birth outcomes and infant mortality. For this reason, it is important to divide the Mexican-born women into two groups, those who speak only Spanish, and those who speak at least some English, for a better analysis of the epidemiologic paradox. Thus, in total, I will work with three groups of women:

a) Mexican-born women who do not speak English (MNE);
b) Mexican-born women who speak at least some English (MSE); and
c) Mexican-Americans (U.S.-born), regardless of their language (MA).

It is important to note that, although I recognize the importance of language spoken among U.S.-born women, I will not separate Mexican-American women according to their language, mainly because of the small number of cases that would result in the sample by doing so.

3.2. Sociodemographic Factors and Birth Outcomes

The importance of sociodemographic factors for the epidemiologic paradox can be viewed under the perspective of proximate causes of compromised birth outcomes as Mosley and Chen (1984) did for the proximate

determinants of child mortality in developing countries. Social and demographic factors have influence on proximate determinants that, in turn, affect outcomes. The first variable in this group is age of the mother at delivery. Young maternal age is associated with preterm and small-for-gestational-age births, while delivering a baby at older ages can also result in compromised outcomes (Collins and Shay, 1994; Frisbie and Song, 2003; Frisbie et al. 1997; Lang et al. 1996).

Marital status of the mother has been included as a variable that helps to predict low birth weight and intrauterine growth retardation. It is common to divide the women into two categories, married (including consensual unions) and unmarried, because it is considered to have effects through proximate risk factors (Frisbie et al. 1997).

Socioeconomic status (SES) is used regularly as an important factor for birth outcomes; disadvantaged socioeconomic status is related to compromised outcomes. Maternal education is one of the key variables reflecting SES, so most studies include it in their analysis (Kallan, 1993; Collins and Shay, 1994; Hummer et al. 1999; Balcazar et al. 1991; Balcazar, 1994; Lang et al. 1996; Crump et al. 1999). Maternal education operates also through proximate determinants of birth outcomes, such as prenatal care, access to the health system, and general health conditions. However, the effect is not always what is expected when the Mexican-origin population is included; it is even non-significant for some birth outcomes (Frisbie and Song, 2003).

Household type is also included here. As stated above, Mexican immigrants tend to arrive in places where other Mexicans are already established. As long as the women stay in those households, they configure a specific profile for that household. Presence of other adults in the household can be helpful for

information about health issues and access to the health system in the United States. Some authors propose this factor as a key element to explain the differences by ethnicity in the prevalence of adverse pregnancy outcomes, particularly between Hispanic and non-Hispanic women (Moss and Carver, 1992). An extended household has been found to have a positive effect on birth weight, since it may provide support and resources for the mother, facilitating positive attitudes and behaviors during the pregnancy, and compensates for income deficits. In contrast, living alone could be detrimental for birth outcomes.

Labor force participation and employment conditions, like hard physical work, can have an influence on birth outcomes, since they can directly affect the health of women. In particular, working while standing up or walking is different than working seated or not being in the labor market (Cerón Mireles et al. 1997). On the other hand, work can influence socioeconomic status in a positive way.

3.3. Income Support Factors and Birth Outcomes

Income support received from government agencies can benefit women and their infants. In the United States, there exist diverse programs that promote health during pregnancy and during the infant's first years through economic aid or in kind help. Some studies have addressed these factors and have found that their impact on birth outcomes is important (Frisbie et al. 1997). At the time of the survey, there were programs available for pregnant women, like the Special Supplemental Food Program for Women, Infants, and Children (WIC), and some other government programs not specifically for pregnancy, but that could have an impact on the birth outcome, such as Aid to Families with Dependent Children (AFDC), Medicaid, and Food Stamps. These variables are likely to have a direct effect on nutrition, access to health services, and information regarding prenatal

care, although access to some of them (e.g., AFDC) require having previous children.

3.4. Behavioral Factors and Birth Outcomes

As discussed before, Mexican-American women are generally more immersed in American culture than Mexican-born women. It has been argued that this implies changes in the behavior that affect the health of women and, therefore, the health of fetuses. Mexican-American women tend to smoke more than Mexican-born women (Balcazar et al. 2001). Smoking and alcohol drinking are associated with low birth weight and intrauterine growth retardation (Kallan, 1993; Lang et al. 1996; Frisbie and Song, 2003; Dunn et al. 2003). Second hand smoke can also be harmful for the health of women and infants (Martinez et al. 1994). In this dissertation, I include smoking and alcohol use; however, second hand smoke is limited only to the father's smoking behavior.

3.5. Biomedical Factors and Birth Outcomes

Variables included in this group are considered to have more direct influence on birth outcomes. Baby's sex is the first variable, since is it well known that female babies are lighter, on average, than male babies (Frisbie and Song, 2003). Regarding prenatal care, there exist many studies that establish the relationship between prenatal care and prevention of compromised birth outcomes (Balcazar, 1991, Frisbie et al. 1997; Collins et al. 1997; Echevarria and Frisbie, 2001; Hummer 1993; Hummer et al. 1995; Frisbie and Song, 2003). As discussed before, prenatal care is part of the epidemiologic paradox, since Mexican-origin women are characterized by low utilization rates of prenatal care. Also, women's health problems could result in excessive prenatal care visits. To combat this problem, I use the index of adequacy of prenatal care developed by Kotelchuck (1994a).

One indicator of maternal health included here is previous adverse pregnancy outcomes, or previous pregnancy loss, because those women that had a miscarriage or stillbirth have a higher likelihood of compromised birth outcomes (Kallan, 1993). Mexican-born women have fewer previous losses than Mexican-American women (Frisbie and Song, 2003; Echavarria and Frisbie, 2001; Frisbie et al. 1997); of course, this variable can have implications only for those women who are not in their first pregnancy. Parity is a variable that has been shown to influence birth outcomes: first births and high parity births are associated with low birth weight and intrauterine growth retardation (Kallan, 1993).

Maternal weight gain during pregnancy is also associated with birth outcomes. Mexican-origin women tend to have low weight gain during pregnancy (Frisbie and Song, 2003), which is related to intrauterine growth retardation (Frisbie et al. 1997). Moreover, too much weight gained during the pregnancy can be the result of health problems of the mother that would result in more prenatal care visits; gestational diabetes, which is more common among Mexican-origin women, is associated with this problem (Buekens et al. 2000; Kallan, 1993).

A few studies of birth outcomes include birth interval as an explanatory variable. Perhaps it is so because it is related with parity. Gribble (1993) found a relationship between birth interval lengths of less than 21 months and 58+ months and low birth weight for two cities in central Mexico during 1986 and 1988. Short birth intervals are a risk for prematurity because of poor fetal growth (James et al. 1999). Other studies have found similar results involving short interpregnancy interval and prematurity (Fuentes-Afflick and Hessol, 2000). These authors found that women with interpregnancy intervals from 18-59 months had the lowest risk of very premature and moderately premature infants, and that women with

interpregnancy intervals less than 18 months, as well as those with intervals more than 59 months, were the most likely to have a very premature or moderately premature infant. This variable will be included to help account for differences in birth outcomes among the different groups of Mexican-origin women.

3.6. Birth Outcome Variable

An infant needs to have at least 2,500 grams of weight at birth to avoid falling into the category of low birth weight; for gestational age, 37 or more weeks determines that a pregnancy has come to full term (Frisbie et al. 1996). In general, Mexican-born women have fewer compromised birth outcomes than Mexican-American women in the United States (Weeks et al. 1999; Palloni and Moreoff, 2001; de la Rosa, 200).

In sum, sociodemographic, income support, behavior, and medical factors are thought to have important impacts on birth outcome, and will help to explain nativity/language differences across Mexican-origin women.

3.7. General Objective

The central objective of this dissertation is to study the relationship between birth outcomes and nationality/acculturation at a site along the U.S.-Mexico border. A diverse set of socioeconomic and demographic characteristics of women, as well as behavioral and health factors, will be investigated for their impacts on the outcomes.

3.8. Specific Hypotheses

1) There are differences in birth outcomes between Mexican-American and Mexican women who give birth at Thomason Hospital in El Paso, Texas. Based on past research, this difference will favor the Mexican-born women.

2) There are differences in birth outcomes between Mexican-born women according to their ability to speak English. More favorable birth outcomes are expected among those Mexican women who do not speak English.

3) Controlling for socioeconomic characteristics, the advantage for Mexican women in terms of birth outcomes will increase. This is because Mexican women are characterized by less favorable sociodemographic characteristics than Mexican-American women.

4) Income support helps lessen the risk of having a compromised birth outcome. Mexican-American women have more access to government help, although Mexican mothers will use help from those agencies that do not require legal status of residence in the United States. I expect that those mothers who use WIC, AFDC, and/or Medicaid have less risk of having a compromised birth outcome.

5) There will be differences in birth outcomes according to behavioral factors, since previous research have shown that smoking and drinking during pregnancy affect pregnancy outcomes. Mexican-American women tend to smoke and drink more than Mexican-born women, so I expect that behavior factors will help explain less favorable outcomes among Mexican-American women.

6) Biomedical variables are expected to be very strong determinants of birth outcomes. Previous loss is more frequent among Mexican-American than Mexican-born women, because abortion is legal and easier to get in the United States, so more previous loss is expected for Mexican-American women. Moreover, prenatal care is expected to play a protective role against poor birth outcomes; Mexican-born women are less likely to receive adequate prenatal care.

7) The effects of these risk factors taken separately are different for each group of women. The government programs have no effect on Mexican-born women, since they have no legal access to them.

In the next chapter, I present the data base and the measures that will be used in this dissertation, as well as the methods to test the hypotheses.

Chapter 4: Data, Measures, and Methods

An essential part of any research is the data set. This chapter presents the survey on which this dissertation is based, discusses key measures, and provides an explanation of variable selections for this research. In addition, the methods to be used to analyze the survey are reviewed.

4.1. Data

Data for this study come from the "Border Women's Maternal Health Survey" carried out at Thomason Hospital in El Paso, Texas (see Map 1 for reference). The main objective of this survey was to obtain information about birth outcomes, risk factors and maternal information regarding several issues, like their social surroundings, their behavior during the pregnancy, problems presented during that time, etc. Thomason Hospital is the largest public hospital in a Texas county bordering Mexico. About 5,000 babies[6] are born there per year, which is about one-third of all births in El Paso[7]. A large fraction of the low income population in El Paso seeks medical attention at this hospital, including a significant proportion of women born in Mexico; some of them are still living on the south side of the border.

The importance of this survey is that it is one of just a few of its kind that is carried on one side of the U.S.-Mexico border but that includes women from both countries[8].

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[6] http://www.thomasoncares.org/

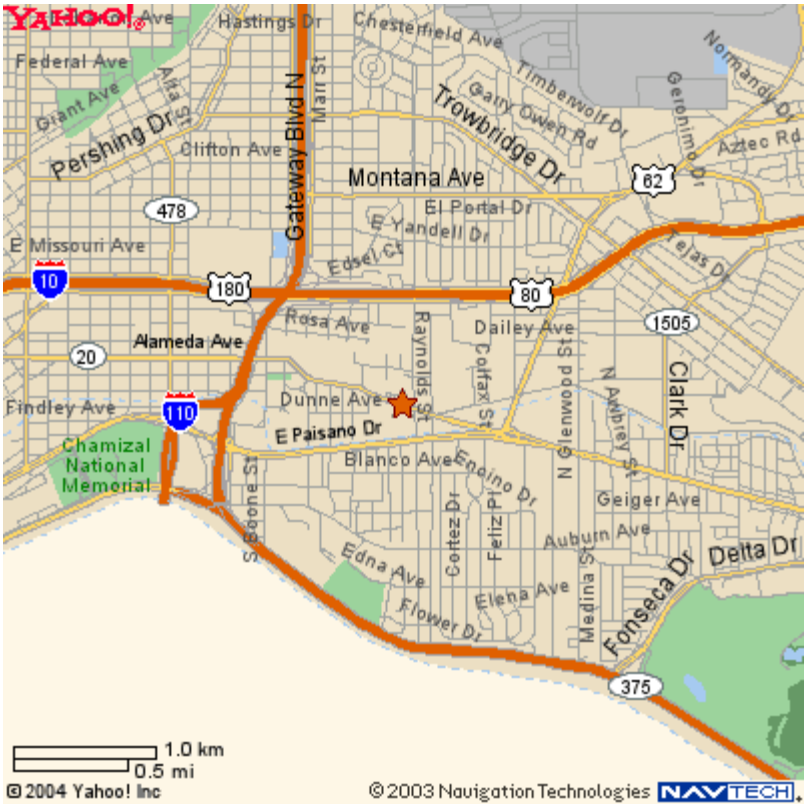
[7] In 1997 there were 14,482 births registered in El Paso County: http://www.cdc.gov/nchs/datawh/statab/unpubd/natality/natab97.htm.

[8] Weeks et al. (1999) carried out a study where women from both sides of the border were included. However, their data were from hospital records, not from a postpartum survey.

Hospital records were used as well to obtain information about the baby's weight and gestational length.

The target population in this survey was all women who delivered a baby at Thomason Hospital during the time that the survey was carried out. The first interview was conducted in January of 1995, and the last one in March of 1997. Mothers of infants born at Thomason Hospital were asked to participate in this project, and those who accepted signed a consent form.

Map 1: Location of Thomason Hospital in El Paso, Texas.



Note: The star indicates the location of Thomason Hospital.
Source: http://maps.yahoo.com

Women who just had a baby in this hospital were asked to participate in the project. The survey contains valuable information on the women's socioeconomic characteristics, as well as health care and general health behavior during the pregnancy, problems during the pregnancy, pregnancy history, and experience of the previous pregnancy and status of the child, work, contraceptive use, and intention of breastfeeding for the new baby. Moreover, a sheet with information from the hospital record of the delivery was added to each questionnaire, so data on gestational age, type of delivery, baby's sex, problems during the labor, complications of the baby, and birth weight are also available. All of the interviews were conducted by female, bilingual, nursing students from the University of Texas at El Paso. They were supervised by a faculty member and researchers working on the study, both from The University of Texas at Austin and from the University of Texas Health Science Center at Houston.

Three versions of the questionnaire were used. For the dissertation, I combine versions 2 and 3 because several of the relevant variables were not available in the first version (pre-test) of the survey. In total, the three versions sum to about 5,400 cases, with the latest two versions summing to just over 5,000 cases.

The fact that there are two different, though very similar, versions of the questionnaire implies that in an important number of cases I do not have the information for the variable because the question was not included in the second version. For instance, the question about maternal weight gain was included only in the last version. Thus, I use missing variable indicators, when needed, to best preserve cases for analysis.

Interviews were conducted in the preferred language of the new mother, so both English and Spanish versions of the questionnaire were always available for the survey. The first version of the questionnaire was considered a pilot, since many questions were left open and the structure was rather simple. It was very useful to elaborate the questionnaire during the later two stages of the study. Thus, the other two were more elaborate, by including options in the answers and by asking many other questions that were pertinent for a better understanding of the factors associated with birth outcomes. The main characteristics of each instrument are as follows:

a) First Version of the Questionnaire (Pilot)

During the first three months of 1995, 333 women were interviewed using this version of the questionnaire. Most of the questions were not pre-coded, requiring the interviewer to write the whole textual answer. Information here included socioeconomic characteristics of the mother, duration of the pregnancy (in months), general risk behavior during the pregnancy (smoking, drinking), health problems (type of problem, month of the pregnancy), diet during pregnancy (times per week she ate meat, fish, eggs, drank milk, and took vitamins), work during the pregnancy, pregnancy history, previous loss, information on her previous child (birth weight, place of birth, breastfeeding), contraceptive methods, and plan to use any contraceptive method. This version was very useful in helping to construct the two later versions used in the analysis here. It helped to determine some categories of answers to several questions, as well as to estimate duration of the interview. It was also useful for the research team to realize that many questions needed to be included, like the question about language and external support through government programs.

b) Second Version of the Questionnaire

Major changes were made for the second version of the questionnaire, which started in March of 1995. The format of the instrument to collect the data was more of a formal questionnaire. Instead of open answers, many more questions were now close-ended. 1789 women were interviewed during the following eight months. In this version, some important questions were added, like whether the woman received WIC and/or AFDC. Also, questions about language spoken at home and questions about women's abilities to speak English (or Spanish) were added.

Moreover, some questions about the work place relevant to pregnancy risk were asked. For example, some of the additional questions included the requirement of use of special clothing and environment in the place of work and how women usually performed work duties (e.g., standing up, sitting, and walking). This questionnaire finished with questions about her plans to breastfeed the new baby and the predicted length of breastfeeding. Periods of time were included month by month for the last five years, where information on work, living with her partner, attending school, use (and type) of a contraceptive method, and pregnancy were recorded.

c) Third Version of the Questionnaire

Minor, but important, changes were made to the last version of the questionnaire; a question about ethnicity was included, as well as maternal weight gain, and place of current residence was added. In the contraception part, the rhythm and Billings methods were put together, and 'other method' option was dropped. Also, the pages with the periods of time were substituted with rather simple questions. This version of the questionnaire lasted for about a year, from

March 1996 to March 1997; 3,263 questionnaires were answered. This version of the questionnaire (in both English and Spanish) is attached in Appendix A.

In sum, a total of 5,385 women were surveyed in all three versions of the questionnaire, and 5,052 new mothers were interviewed with either the second or the third version. However, as noted before, not all variables are available in both the second and third instruments. An important note here is that I will not consider multiple births, since they are very likely to be of low weight and premature. In addition, missing cases for some key variables limit the number of cases for the analysis, although the overall amount of missing data is quite small.

4.2 Limitations

It is worth noting that this data base has some restrictions. Besides the fact that not all of the information for all the women who had a baby at Thomason Hospital is available, it is also not a population-based statistical sample. Thus, the results are valid only for those women interviewed, and are probably not a reflection of the overall reality in El Paso, the U.S., or Mexico. The ethnic composition in this city is predominantly Hispanic; African American, Native American, Asian American women and women from other race groups are so few that they are not included in the analysis. In addition, the non-Hispanic white population is too small in relative terms for this analysis: less than 2 percent of women who delivered were white[9].

[9] According to the data from version 3 (the only one with 'ethnicity' as a question), 96.5% of the women were Hispanics, 1.8% were non-Hispanic Whites, and the rest were African-Americans, Native-Americans, and Asian-Americans.

One important limitation is that most of the key information is self-reported by the women. Data regarding gestational age and birth weight were mostly gathered from the hospital records, but information on smoking, alcohol use, previous losses, and weight gain during pregnancy had to rely on women's responses. Thus, there is a risk of reporting error for a number of items.

My focus in this research is on the Mexican and Mexican-American women only. Excluding small numbers of women from different ethnic groups, most of the analysis is based on 4,818 cases, from both the second and third versions, with 2,962 questionnaires that include all the variables needed for analysis.

4.3. Measures

As discussed before, effects on birth outcome of several factors, including variables associated with socioeconomic and demographic characteristics (age of the mother, education, marital status, income support), behavior during the pregnancy (smoking, alcohol use, diverse problems), and biomedical characteristics (baby's sex, prenatal care, mother's weight gain, parity, inter-pregnancy interval, loss history) will be measured.

The dependent variable is the birth outcome, divided in four categories according to birth weight (in grams) and gestation time (in weeks): Normal, Light Preterm, Intra-Uterine Growth Retardation, and Heavy Preterm. It is important to note that this information comes from the hospital records, not from the interview with the new mother, except for just a very few cases. For purpose of this research, 'Normal' outcome refers to those births that weigh at least 2,500 grams and the pregnancy lasted at least 37 weeks. Low birth weight (less than 2,500 grams) is separated in two categories: Light Preterm and Intra-Uterine Growth

Retardation (IUGR); the first refers to those births whose pregnancy lasted less than 37 weeks, while the latter category refers to infants born in the 37th week or later. The Heavy Preterm category includes babies with normal weight but who were born before the 37th week in the pregnancy. In summary, the classification for birth outcomes is presented in Table 4-1.

Table 4-1: Birth Outcomes Classification According to Weight and Gestation Length.

WEIGHT	GESTATION TIME	
	Less than 37 weeks	37 weeks and more
Less than 2,500 grams	Light Preterm	IUGR
2,500 grams and more	Heavy Preterm	Normal

This categorization has been shown to be highly valuable for studies of infant mortality (Frisbie et al. 1996) and later child health outcomes (Hummer et al. 1999). While more recent studies (Solis et al. 2000) propose continuous birth outcomes measures, the fairly limited number of low weight births available in this study forces me to use the more simplified four-category scheme detailed above.

The women included in this study are divided into three categories according to their country of origin and, among Mexicans, their ability to speak English. Thus, to construct the category "Mexicans, Speak No English" I selected all those women who were born somewhere in Mexico and also answered that they speak Spanish at home and either they don't speak English, or their ability to speak English is limited ("better" or "much better in Spanish"). Table 4-2 shows

that 61 % of the women fall into this category; they are by far the majority of the people included in the survey. “Mexicans, Speak Some English” are all those women who were born in Mexico, who declared that they usually or always speak English at home; they comprise only 13.5 % of the sample. Finally, Mexican American women (25.5 %) are all those who were born in the United States, without considering their language.

Table 4-2: Percentage Distribution of Women Interviewed by Nationality/Language, Thomason Hospital, 1995-1997.

Nationality/Language	Frequency	Percent
Mexican/No English	2,939	61.0
Mexican/Some English	647	13.5
Mexican American	1,299	25.5
Total	4,815	100.0

Source: Women’s Maternal Health Survey, Thomason Hospital.

The predictor variables are divided in four major groups for a more thorough analysis and understanding of their effects: socioeconomic and demographic, income support, behavior, and biomedical variables. A description of these variables and their measurement schemes are as follows.

a) Socioeconomic and Demographic Factors

Among the socioeconomic and demographic variables that will be included in this analysis, age at delivery is expected to be a factor, especially at extreme ages, for adverse birth outcomes. The categories for this variable are “less than 20”, “20-34”, and “35 and more”. Marital status is dichotomized into “not married” (which includes single women, divorced, separated, and widows) and “married” (including those who are not legally married, but living with a male

partner). Table 4-3 summarizes the measurement of the socioeconomic and demographic variables.

"Education" is a variable that is not directly comparable across contexts, since education systems are different when comparing the two sides of the border; however, in order to make them comparable, three groups were considered based on the years of school completed by the woman. The first group is equivalent to "up to primary" level in Mexico (up to 6 years, including no education at all), while the second is similar to "up to preparatoria" (high school); the last category can be understood as "more than high school".

The variable "household composition" is seen here as a source of internal support for the mother-to-be during her pregnancy. This variable is constructed using the questions on who is living with the woman during pregnancy. They had up to 4 different answers for the same question, so a simple categorization of the household structure can be made. *Nuclear* refers to households where the woman lives with her husband or partner, either with or without children. *Her original family*, which is technically a nuclear family, is coded when the woman answered that she is living with her father/mother, including siblings, with no other relatives in the household. Support for these women can be totally different than those who are married and living with her spouse. It is important to note that a woman living only with her brothers/sisters is not considered in this category, but as an *Extended household*, which can be defined as those where other relatives are present. *Other* refers to arrangements where a non-relative is living with the women.

Table 4-3: Socioeconomic and Demographic Variables and their Measurement Schemes

Socioeconomic and Demographic Factors	Categories
Age of mother at delivery	Less than 20 years old 20-34 years old 35 and more years old
Marital status	Single Married/with a partner
Maternal Education	0-6 7-11 12 and more Unknown
Household Composition	Nuclear Her original family Extended Other Alone/with children
Labor Force Participation	Yes No
Work Conditions	Not working Work-Seated Work-Standing up Work-Walking Unknown

Finally, many woman stated that they were living alone, and often "alone with her children". This is important to combine "alone" with "alone with her children" since they probably faced similar circumstances, such as not having more adult support in the house while pregnant.

The last variables included in this set of factors are labor force participation and work conditions. All women were asked if they were working since her previous delivery, or at any time during the past two years, as well as her working conditions, related to her physical position during most of the time at work, including sitting down, standing up, walking, or any combination of these three options. Although income from a job can be favorable for the social characteristics of the woman, the working conditions can affect the baby in several ways. In particular, strenuous work may be associated with adverse outcomes (Cerón-Mireles et al. 1997).

b) Income Support Factors

Income support here refers to any aid from the government, directly provided to the women either in cash or in kind, to promote a better life condition in general, or to support a better pregnancy and the baby's first years. This variable is classified according to whether the woman did or did not receive some specific help from different government agencies in the United States. According to Frisbie et al. (1997), one of the most important programs because of its impact on birth outcomes is Women, Infants, and Children (WIC, formerly known as the Special Supplemental Food Program for Women, Infants, and Children), which is a program from the U.S. Department of Agriculture. The main objective of WIC is "*to safeguard the health of low-income women, infants, and children up to age 5 who are at nutritional risk by providing nutritious foods to supplement diets, information on healthy eating, and referrals to health care*"[10]. The categories for this set of variables are shown in Table 4-4.

[10] http://www.fns.usda.gov/wic/ According to this web page, the WIC program was in its 25th anniversary in 1999.

Aid to Families with Dependent Children (AFDC) was a program at the time of the survey[11] carried out by the Department of Health and Human Services that could have some positive impact on birth outcomes. The last two programs (Food Stamps and Medicaid) are not directly related to pregnant women or their babies, but will be tested for any effect on birth outcomes. Food Stamps is available only for poor, legal U.S. residents, while Medicaid provides health care for poor individuals, which could have an impact on the mothers regarding their birth outcome.

Table 4-4: Income Support Variables and their Measurement Schemes.

Income Support Factors	Categories
Received WIC	No Yes Unknown
Received AFDC	No Yes Unknown
Received Food Stamps	No Yes Unknown
Received Medicaid	No Yes Unknown

[11] This program was substituted, along with several other welfare programs, in July 1st, 1997 by TANF (Temporary Assistance for Needy Families), from the same agency.

c) Behavioral Factors

It is well known that smoking and alcohol drinking have adverse effects on birth outcomes. These two variables, which are presented in Table 4-5, are measured by whether or not the woman smoked, either before or during the pregnancy, and if she drank any alcohol during pregnancy. Also, the questionnaire includes one question on second-hand smoke, though it is only in reference to the woman's husband or partner. These three variables have just two options, plus one category for unknown.

Table 4-5: Behavioral Variables and their Measurement.

Behavior Factor	Categories
Smoked	No Yes
Drank	No Yes Unknown
Husband/partner smokes	No Yes Unknown

d) Biomedical Factors

The biomedical factors considered here are presented in Table 4-6. The first variable is baby's sex. Higher male infant mortality is well known; but also is it well known that female babies are lighter, on average, than male babies (Cervantes et al. 1999). Regarding prenatal care, the Adequacy of Prenatal Care Utilization (APNCU) index is used, which was developed by Kotelchuck (1994a). This index takes into account several issues regarding prenatal care. First, it considers the trimester in which the woman attended the clinic for the first time in order to have medical care for her pregnancy, not just to confirm that she was

actually pregnant. Second, the number of visits to the provider is also taken into account. Third, the index considers the number of weeks that the pregnancy lasted. Then, by comparing to recommended national standards, prenatal care is classified as Inadequate, Intermediate, Adequate, or Adequate Plus. Usually, this last category includes pregnancies of high risk, because the mother may have a medical condition that could result in more visits than national recommendations (Kotelchuck, 1994b).

For the dichotomous variable "loss history", all those women that had a previous pregnancy that did not end in a child born alive are included here. These events include abortions, miscarriages, and stillbirths. Both prior losses and high parity are mentioned in the literature as risk factors for adverse birth outcome (Cramer, 1995; Hummer et al. 1999).

Parity is included here using the categories proposed by Kleinman and Kessel (1987), with an initial category for those women that had their first child. Low parity means that the woman is having her second child and her age is 18 years old and older, or she is having her third child and her age is 25 years old and older. High parity includes those women that are less than 18 years old and are having their second or more child, those who are less than 25 years old and having their third or more child, and also those who are 25 years or older and having their fourth or more child.

Table 4-6: Biomedical Variables and their Measurement.

Biomedical Factors	Categories
Baby's sex	Male Female
Adequacy of Prenatal Care Utilization	Inadequate Intermediate Adequate Adequate Plus
Loss history	First Pregnancy Previous loss No previous loss
Weight gain	Up to 14 pounds 15-24 pounds 25+ pounds Unknown
Parity	First Child Low High
Birth interval	First birth Less than 24 months 24 to 47 months 48 and more months

Birth interval is also included among biomedical factors that can affect the birth outcomes. Consistent with previous studies (Zhu et al. 1999; Fuentes-Afflick and Hessol, 2000), short intervals are associated with adverse perinatal outcomes. These authors used 18 months and 23 months as the break point for their categories. In this study, however, due to the limited number of cases, birth interval is categorized as first pregnancy, less than 24 months, 24 to 47 months, and 48 and more months since the previous delivery.

Weight gain during the pregnancy is another biomedical factor that has been used in other studies to explain birth outcomes (Cervantes et al. 1999; Fuentes-Afflick and Lurie, 1997; Frisbie and Song, 2003; Landale et al. 2000; Hummer et al. 1995). The argument is that weight gain of less than 15 pounds during the pregnancy is associated with compromised birth outcomes, and weight gain of 25 pounds or more is associated with positive outcomes. The classification for this variable is given in three categories: low weight gain (less than 15 pounds), normal weight gain (15 to 24 pounds), and high weight gain (25 or more pounds).

One important aspect to note is that I leave the category 'unknown' in several variables, most notably weight gain, because this question was included only in the third version of the questionnaire. In order to preserve the information on more than 1,700 women from the second version of the survey, as well as several cases for the rest of the variables, it is necessary to incorporate categories for missing data. This method has been utilized without detriment to the analysis in previous related research (Frisbie et al. 1997; Hummer et al. 1999).[12]

[12] Both studies use birth certificate data from California and other states that do not include information on maternal smoking and/or weight gain. They both include the category 'missing' in their analysis.

4.4. Methods

Descriptive analysis is used first in order to show the main differences and similarities among Mexican and Mexican-American women on all the variables included here. Then the data are analyzed by using multinomial logistic regression analysis, since the dependent variable (birth outcome) is categorical (Powers and Xie, 2000). Multinomial logistic regression yields the log-odds for the effect of each risk factor on different compromised birth outcomes. Sets of logistic regression models are estimated for each group of risk factors, and one more for a combination of all three groups of variables. The log-odds coefficients are exponentiated to obtain the odds ratios, relative to normal births, and relative to the reference category for each independent variable (Aldrich and Nelson, 1984). Odds ratios and their p values will help to determine if there are differences between Mexican-American women and Mexican-born women, and between those who speak English or not.

I emphasize that the information used here does not come from a population-based sample in the statistical sense of the term, so emphasis will be placed more on the odds ratios rather than on levels of significance. Nevertheless, significance test are important to rule out the "chance-processes" alternative (Blalock, 1979). I will treat the information as a unique universe of women, with the common characteristic of their delivery of a new born baby at Thomason Hospital in El Paso, Texas.

In summary, this chapter presented the survey and its different versions; the data set, its characteristics, advantages, and limitations. A brief description of the instruments to collect the data, along with its restrictions, was offered.

I follow previous research on the subject by considering four categories for the dependent variable (birth outcomes), mainly because the data file is limited in terms of cases included. Language spoken at home will serve as a marker to categorize the new mothers, looking for a relationship between outcomes and ethnicity, based on language and country of birth.

In the next chapter I describe the women who delivered a new baby at Thomason Hospital. Then, in the following chapters, I use multinomial logistic regression to analyze the information and to test the hypotheses. The regression analysis uses the complete sample and focuses on differences across the three nationality/language groups. Multinomial logistic regression is appropiate when the dependent variable is multi-categorical, and a set of risk factors is used to predict the outcomes (Powers and Xie, 2000). I report all coefficients in the forms of odds ratios.

Chapter 5: Descriptive Analysis of the Data

A first look of the data file is always necessary to know the basic aspects of the population to be analyzed. This chapter presents a descriptive analysis of the information regarding all variables to be included here, separated by nationality/language. Percent distributions are used to show differences among categories of women; mean differences are reported for continuous variables when appropriate.

5.1. Birth Outcomes

Since birth outcomes are the main subject in this research, I start by showing the principal differences on this variable by nationality/language. As shown in Table 5-1, "normal" outcomes comprise 88.9% for all women, while heavy preterm is the most common type of the compromised birth outcomes, with almost 5%. Low birth weight outcomes represent 6.1% of the sample, divided into 2.4% for IUGR, and 3.7% for light preterm.

Table 5-1: Percent Distribution of Birth Outcomes to Women by Nationality/Language, Thomason Hospital, 1995-1997.

Birth Outcomes	Nationality/Language			Total
	Mexican/No English	Mexican/Some English	Mexican-American	
Normal	90.0%	88.3%	86.6%	88.9%
Heavy Preterm	4.5%	5.4%	5.9%	4.9%
IUGR	2.2%	3.1%	2.5%	2.4%
Light Preterm	3.3%	3.2%	5.0%	3.7%

When we observe these outcomes by nationality/language, we notice that Mexican/No English (MNE) women have the highest percent of 'normal' outcomes (90%), compared with those who speak some English (88.3%), and those women who were born in the United States (86.6%). Regarding the

compromised outcomes, women of all three groups had mainly heavy preterm infants, with Mexican-American (MA) presenting the highest level at 5.9%, and MNE having the lowest percent (4.5%). IUGR outcomes are slightly more common among Mexican/Some English (MSE) than the other two groups of women, but the totally compromised outcome category 'light preterm' includes 5% of all babies born to Mexican American women, though only about 3.2% for Mexican born mothers. In general terms, from Table 5-1, we can start by saying that babies born to Mexican women have an advantage over babies whose mothers were born in the United States. This finding coincides with other studies of nationality/language differences in birth outcomes that found that Mexican-born women have better birth outcomes than U.S. born women (Palloni and Morenoff, 2001; Cervantes et al. 1999; Weeks et al. 1999; Crump et al. 1999; English et al. 1997; Singh and Yu, 1996).

5.2. Sociodemographic Factors

Table 5-2 shows the composition of the three categories of women along with their sociodemographic characteristics. It can be observed that Mexican-Americans are in general younger than the rest of the mothers: an average of 23 years old compared to 24.1 for the MSE, and almost 26 for the MNE (both differences: $p<0.001$). Teenagers represent more than 31% of MA, while only 24% of MSE are less than 20 years old, and 14.4% of MNE are less than 20 years old. This could be a key factor in explaining the larger proportion of compromised babies among MA mothers. Moreover, more than three-quarts of MNE are in the group 20-34, which is considered the lowest risk group (Singh and Yu, 1996). MA women have only 63.5% in this group, and MSE have 70%. Still, 9% of MNE are older than 35 years old, which can also be a risk factor for compromised outcomes. MSE and MA have about 5% in this age group. These results are similar to other studies that found that Mexican-American childbearing women

are younger than Mexican-born childbearing women in the United States (Callister and Birkhead, 2002; Weeks et al. 1999; Cervantes et al. 1999; Crump et al. 1999).

Marital status is another key factor that shows a big difference across groups. Two-thirds of the mothers born in Mexico are married or living with a partner, while just 55% of mothers born in the U.S. are in this category. This can represent a substantial disadvantage for Mexican-American mothers. These results are similar to those found by Crump et al. (1999) and by Cervantes et al. (1999), that Mexican-American women are more likely to be younger and unmarried at time of delivery.

Education is a different story when contrasting the three categories of women. Only 5% of MA women have 6 years or less of education, compared to 28.6% of MNE and 11.9% of MSE women; moreover, almost half of MA women have 12 or more years of education, whereas only 22.4% of MNE and 38.9% of MSE mothers have 12 or more years. On average, Mexican-American women have 2 years more of education than MNE women, though only a half year over MSE mothers (both differences: $p<0.001$). The literature regarding this subject has also found that Mexican-born women have less years of education than Mexican-American women (Callister and Birkhead, 2002; Weeks et al. 1999; Cervantes, et al. 1999; Crump et al. 1999).

Table 5-2: Distribution of Socio-Demographic Risk Factors by Nationality/Language, Thomason Hospital, 1995-1997.

Variable	Categories	Mexican/No English	Mexican/Some English	Mexican-American	Total
Age of the Mother*	12-19	14.4%	24.1%	31.4%	20.0%
	20-34	76.5%	70.2%	63.5%	72.3%
	35+	9.1%	5.7%	5.1%	7.6%
	(Mean & Std. Dev.)	(25.9 & 6.05)	(24.1 & 5.67)	(23 & 5.78)	(24.9 & 6.06)
Marital Status*	Not married	33%	33.1%	44.4%	35.9%
	Married	67%	66.9%	55.6%	64.1%
Years of Education*	0-6	28.6%	11.9%	5.0%	20.4%
	7-11	49.0%	49.1%	46.1%	48.3%
	12+	22.4%	38.9%	48.7%	31.3%
	Unknown	0.0%	0.0%	0.1%	0.0%
	(Mean & Std. Dev.)	(8.9 & 2.94)	(10.4 & 2.69)	(10.9 & 2.23)	(9.6 & 2.88)
Type of Household*	Nuclear	53.9 %	54.9%	44.9%	51.7%
	Original Family	5.8 %	14.1%	22.4%	11.1%
	Extended	32.0 %	24.7%	23.2%	28.8%
	Other	4.8 %	2.5%	3.1%	4.0%
	Alone/with children	3.6 %	3.9%	6.4%	4.3%
Ever work*	Yes	73.2 %	68.0%	60.0%	69.1%
	No	26.8 %	32.0%	40.0%	30.9%
Conditions at Work place*	Not working	73.2%	68.0%	60.2%	69.2%
	Seated down	8.1%	8.5%	9.4%	8.5%
	Standing up	6.6%	9.9%	16.4%	9.6%
	Walking	6.6%	6.0%	6.4%	6.5%
	Other	0.5%	0.5%	1.3%	0.7%
	Seated and walking	0.1%	0.0%	0.1%	0.1%
	Standing up/walking	3.6%	5.7%	4.3%	4.1%
	Unknown	1.3%	1.4%	1.8%	1.5%

* Chi square: $p < 0.001$

Type of household is another factor that can have an effect on birth outcomes, since it can be seen as a source of support in several aspects. More than one-half of the women live in nuclear households, though there is a clear difference according to nationality/language: about 54% of women born in Mexico live in nuclear households, compared to 45% of the MA women. MA women present a larger proportion of living with their original family (22.4%), that is, they were still living in their parents' home with no other members besides her siblings and her parents. Extended households, which can provide extra support for the expecting mother, are more common among MNE, with almost one-third of the category, in contrast with 24.7% and 23.2% for MSE and MA,

respectively. But the women that have no family support in their home are those who live alone, or 'alone' with her children (as they perceive themselves); 6.4% of MA women are in this last category, in contrast to less than 4% for mothers born in Mexico.

Labor force participation can be seen from two different perspectives; on the one hand a woman can improve her socioeconomic characteristics through income derived from her work. On the other hand, working conditions such as hard work, working standing up, and even walking, can affect the outcome of pregnancy. Results from this survey show rather low female economic activity, especially for women born in Mexico, who present rates of 27% of MNE women that ever worked, and 32% for MSE. About 40% of Mexican-American women have worked. Although is not comparable directly, the National Employment Survey in Mexico in 1995 showed that the labor force participation rate for women at the national level was 36.4% and 43.1% for age groups 15-24 and 25-54, respectively (INEGI-STPS, 2003). Here, Mexican-American women were most likely to report working and to work while standing.

In general, Mexican-American women have more favorable sociodemographic characteristics than Mexican-born mothers. This is particularly the case with education. Previous studies have indicated that such factors are related to compromised birth outcomes (Palloni and Morenoff, 2001; Zambrana et al. 1999; Cervantes et al. 1999). As such, controlling for this group of factors should widen the baseline birth outcome differences between Mexican and Mexican-American women.

5.3. Income Support Factors

Income support can also help to reduce the prevalence of compromised outcomes. The survey collected information on two (four in the third version) different sources of social aid. In this case, it is clear that MA women use more aid from the government. Knowing some English seems to be useful for Mexican-Americans, since they consistently have a larger percent than Mexican women that speak English. The WIC program is the only one that was designed specifically for pregnant women and their children of 5 years old and less; MA and MSE used WIC in a greater proportion than the MNE women. This information is presented in Table 5-3.

Table 5-3: Distribution of Income Support Risk Factors by Nationality/Language, Thomason Hospital, 1995-1997.

Variable	Categories	Mexican/ No English	Mexican/ Some English	Mexican-American	Total
Received WIC*	No	29.5%	20.6%	17.4%	25.2%
	Yes	70.4%	79.4%	82.5%	74.7%
	Unknown	0.1%	0.0%	0.1%	0.1%
Received AFDC*	No	88.6%	82.1%	79.1%	85.3%
	Yes	9.1%	12.2%	14.2%	10.8%
	Unknown	2.3%	5.7%	6.7%	3.9%
Received Food Stamps*	No	57.6%	39.6%	33.6%	49.1%
	Yes	23.8%	26.4%	33.3%	26.6%
	Unknown	18.6%	34.0%	33.1%	24.4%
Received Medicaid*	No	53.9%	31.5%	20.7%	42.5%
	Yes	27.4%	34.5%	46.2%	33.2%
	Unknown	28.6%	34.0%	33.1%	24.4%

* Chi square: $p < 0.001$

Moreover, Mexican-American women received more support from other programs that are not directly related with pregnancy, like AFDC, Food Stamps, and Medicaid than Mexican-born mothers. However, the level of use of these programs by ethnicity differs from other studies, where the percentage is rather

low; for example, Frisbie et al. (1997) found that 47.2% of Mexican-American women in a national sample received WIC, in contrast with 82.5% of the MA women included in this study. Also, Hessol and Fuentes-Afflick (2000) found that 57.5% of Mexican-American women received Medical (California), in comparison with 69% of the same ethnic group for this study (adjusted for unknown; not shown on table). The higher levels of government programs use reported here probably reflect the low socioeconomic status of the population who seek medical care at Thomason Hospital.

5.4. Behavioral Factors

The characteristics in this group of risk factors are shown in Table 5-4. Smoking mothers include almost 16% of the women in the survey, while drinking includes 12%. Again, Mexican American mothers more often present characteristics that can result in a disadvantage for the well being of the new born child: one fifth reported smoking regularly, in contrast to 15.3% of MSE and 14.1% of MNE women. Again, this does not necessarily mean that these women continued to smoke during pregnancy. The question specifically asked was "Have you ever smoked?".

Table 5-4: Distribution of Behavior Risk Factors by Nationality/Language, Thomason Hospital, 1995-1997.

Variable	Categories	Mexican/No English	Mexican/Some English	Mexican-American	Total
Smoker*	No	85.9%	84.7%	79.9%	84.2%
	Yes	14.1%	15.3%	20.1%	15.8%
Drinker*	No	89.8%	90.0%	81.9%	87.8%
	Yes	10.1%	10.0%	18.1%	12.1%
	Unknown	0.1%	0.0%	0.0%	0.1%
Smoker Husband* +	No	71.5%	72.8%	69.0%	71.1%
	Yes	28.3%	26.3%	30.6%	28.5%
	Unknown	0.2%	0.9%	0.4%	0.4%

+ Only for those women who are married or living with partner.

* Chi-square: $p<0.001$

These data confirm that Mexican-American women smoke more than MNE and MSE women, and is consistent with several previous studies that state that it is a behavior that not only affects birth outcomes (Cohen et al. 2001; English et al. 1997; Crump et al. 1999; Weeks et al. 1999; Hummer et al. 1999; Magee et al. 2004; Palloni and Morenoff, 2001), but also may differentiate women by nationality and acculturation.

Effects of heavy alcohol use on fetal development are well known to be adverse. As in other studies (Weeks et al. 1999; Crump et al. 1999), consuming alcohol during the pregnancy is more common among Mexican-American mothers (18%) than Mexican-born women, among whom reported only 10% stated that they had had drank alcohol. Again here, the specific question asked, "Do you drink (beer, wine, or some other type of alcoholic beverage)?".

For those mothers who were married or living with a partner, a larger proportion of Mexican-American mothers have been exposed to second-hand smoke because of their partner. However, we do not know the proportion of women exposed to second-hand smoke due to other people in the household or workplace, which can be equally dangerous for the mother and the new baby's health. Overall, it is clear that Mexican-American women seem to be at greatest risk due to behavioral factors, which is consistent with a great deal of literature on the epidemiologic paradox.

5.5. Biomedical Factors

This group of variables includes five risk factors, as well as baby's sex, that can affect the birth outcome. It is worth noting that the sex ratio for the total sample is 103.7, which is consistent with the usual value of 105 male babies per 100 female new born (Preston et al. 2001). This information is presented in Table 5-5.

Table 5-5: Distribution of Biomedical Risk Factors by Nationality/Language, Thomason Hospital, 1995-1997.

Variable	Categories	Mexican/ No English	Mexican/ Some English	Mexican-American	Total
Baby's Sex	Male	50.7%	50.1%	51.8%	50.9%
	Female	49.3%	49.9%	48.2%	49.1%
Sex ratio+		102.8	100.4	105.8	103.7
Adequacy of Prenatal Care Utilization*	Inadequate	37.0%	27.4%	33.3%	34.8%
	Intermediate	11.4%	10.4%	10.5%	11.0%
	Adequate	34.8%	38.3%	35.2%	35.4%
	Adequate Plus	15.9%	22.4%	19.8%	17.7%
	Unknown	0.9%	1.5%	1.2%	1.1%
Loss History*	First Pregnancy	32.8%	37.1%	40.8%	35.5%
	With previous loss	16.5%	14.8%	19.0%	16.9%
	Without previous loss	50.6%	48.1%	40.1%	47.6%
Parity*	First Child	35.7%	40.0%	47.2%	39.2%
	Low	45.2%	40.6%	34.2%	41.7%
	High	19.1%	19.3%	18.6%	19.0%
	Average (Children per woman) and Standard Deviation	2.2 (1.26)	2.1 (1.33)	2.0 (1.20)	2.1 (1.26)
Pregnancy Interval*	First Pregnancy	32.9%	37.1%	40.8%	35.5%
	Less than 2 years	15.3%	20.1%	20.3%	17.2%
	2 to less than 4 years	21.1%	19.3%	19.4%	20.4%
	4+ years	27.8%	20.7%	16.3%	23.9%
	Unknown	2.8%	2.8%	3.2%	2.9%
	Average (in months) and Standard Deviation	51.2 (35.60)	43.0 (32.13)	40.7 (32.80)	47.7 (34.84)
Maternal Weight gain*	Up to 14 lbs.	8.8%	6.2%	5.0%	7.5%
	15-24 lbs	18.2%	15.6%	13.5%	16.7%
	25+ lbs	32.5%	31.8%	28.9%	31.5%
	Unknown	40.5%	46.4%	52.6%	44.4%

+ Number of males per 100 females

* Chi-square: $p<0.001$

Perhaps most important among this group of variables is the Adequacy of Prenatal Care Utilization Index (APCU); more Mexican women who do not speak English received inadequate prenatal care (37%), while one-third of the Mexican-

American women fall in this category. Mexican mothers with some English present the lowest percent (27.4%) of inadequate care, as well as the largest percentage of adequate care utilization (38.3%). In this index, the adequate plus category indicates that the mother had increased medical risk, most likely due to pre-existing conditions, such as high blood pressure, diabetes, or any other disease that requires special attention during the pregnancy (Kotelchuck, 1994a). The highest value for adequate plus is presented by MSE, though 20% of Mexican-Americans also received adequate plus care. Previous studies showed similar findings, where Mexican-born women tend to present a higher percentage of inadequate care (English et al. 1997; Crump et al. 1999). Collins et al. (1997) found that 28% of Mexican-American women received inadequate care in a study that was Chicago based.

A previous loss is also considered here as a risk factor; however, many women were pregnant for the very first time. Almost 41% of the Mexican-American women were in their first pregnancy. Yet this group of women also had 19% with a previous loss. In contrast, with the mothers born in Mexico, just 16.5% of MNE women and 14.8% of MSE women reported a previous loss.

The difference in the average number of children born to MSE and MA women is not statistically different, around 2 children per woman, although it is different when compared with Mexican mothers who do not speak English ($p<0.001$). High parity is also similar for all three categories of mothers: it is around 19%, while 47.2% of Mexican-American and 40 % of MSE mothers were having their first baby. Low parity is somewhat more common among women born in Mexico and even higher for those who don't speak English. On the other hand, 47.2% of Mexican-Americans were having their first child. These results are rather different from other studies; Cervantes et al. (1999) found that

immigrant Mexicans have a larger proportion of high parity women, while the average number of children was also slightly over 2 children per women.

For pregnancy interval, MNE women have the highest average length in months, 51.2, which is different from Mexican-American women ($p<0.001$). When MSE women are compared with Mexican-American women, this average is not statistically different. Mexican women who don't speak English present the lowest value (15.3%) in the category of less than 2 years, which is the one that is expected to be most related to compromised outcomes. In contrast, about 20% of MA women and MSE women had short pregnancy intervals.

As mentioned before, "maternal weight gain" was included only in the last version of the questionnaire, so many women have missing information. That is reflected by the high percent of unknown for each group. Of women with good data reported here, the highest percentage of very low weight gain was among MNE women. In the study by Frisbie and Song (2003), the group with the highest percentage of low weight gain was Mexican-Americans compared with other ethnic groups in the United States.

In sum, most of the demographic variables tend to favor babies born to Mexican/No English mothers. Among the women who had a new born at Thomason Hospital, those mothers had better birth outcomes, were more likely to be between 20 and 34 years of age, were more likely to be married (along with Mexican mothers that speak some English), smoke the least (first and second hand), and drank less than their Mexican-American counterparts. Mexican-American mothers, on the other hand, received more aid from government agencies, especially Medicaid and food stamps; AFDC receipt was also more common among women that were born in the United States. Some biomedical

variables also favor Mexican mothers. While the three groups have similar numbers of children, fewer Mexican mothers have had a previous loss, and their pregnancy interval was often longer than Mexican Americans; moreover, a larger proportion of Mexican-American women were in their first pregnancy.

Thus, overall, it seems like Mexicans who do not speak English have better conditions to deliver a healthier new born than Mexicans that speak some English, who in turn have their own advantage over Mexican-American mothers. The following chapter analyzes each set of factors to determine their influence on nationality/language differences in birth outcomes.

Chapter 6: Logistic Regression Analysis

In this chapter I use multinomial logistic regression analysis to analyze the association between birth outcomes and different sets of risk factors. I start by analyzing each set of variables separately, and then I combine selected variables from each group into a multivariate model.

The first step is to examine the simple effect of nationality/language on birth outcomes. Table 6-1 presents the odds ratios for having a light preterm, heavy preterm or an IUGR infant based on nationality/language alone.

Table 6-1: Multinomial Logistic Regression Odds Ratios for Birth Outcomes by Nationality/Language, Thomason Hospital, 1995-1997.

Birth Outcome	Nationality/Language	Odds Ratio
Light Preterm	Mexican/No English (ref)	- - -
	Mexican/Some English	1.01
	Mexican-American	1.61 ***
IUGR	Mexican/No English (ref)	- - -
	Mexican/Some English	1.40
	Mexican-American	1.17
Heavy Preterm	Mexican/No English (ref)	- - -
	Mexican/Some English	1.24
	Mexican-American	1.37 **
-2 Log Likelihood		4472.5716

Normal Outcome is the comparison group
**p<0.05; ***p<0.01

According to this model, Mexican-American women are 61% more likely to have a light preterm infant and 37% more likely to deliver a heavy preterm baby than Mexican women who do not speak English. Although not statistically significant, the odds ratio for MA women having an IUGR baby is 17% higher than for MNE. For MSE, there are no significant differences with MNE for

having a compromised birth outcome, although it seems that the tendency is most favorable to those women who do not speak English. So, considering only nationality/language, Mexican-American women are at higher risk of having a light preterm or a heavy preterm baby compared to MNE women. This is consistent with the majority of the literature reviewed for this dissertation on the epidemiological paradox (Cervantes et al. 1999; Collins and Shay, 1994; Cohen et al. 1993; Crump et al. 1999; de la Rosa, 2002; English et al. 1997) that demonstrates that Mexican-born women tend to have fewer compromised birth outcomes. In this case, Mexican women who do not speak English, and so are less embedded in the United States culture, have less risk of a light preterm infant.

Does this disadvantage for MA women hold up when we consider different risk factors? Following is an analysis of compromised birth outcomes and their risk factors. Three models were estimated using multinomial logistic regression, adding a group of variables in each model. Normal birth outcome is the reference category. Due to space constraints, the models are divided into 3 separate tables, one for each compromised birth outcome, but all are part of a single multinomial regression model.

6.1. Light Preterm Risk Factors

Table 6-2 shows the relationship between nationality/language, sociodemographic factors, income support factors, biomedical factors[13], and light prematurity.

[13] It is important to note that behavioral factors are excluded from the models. The reasons are that the rate of smoking and/or alcohol drinking among Mexican American women and Mexican-born women is rather low, which would lead to inconsistent results, such as positive effects on birth outcomes. The limited number of women in the data set from Thomason Hospital project just did not reflect the harm posed by smoking and/or drinking.

Table 6-2: Odds Ratios for Multinomial Logistic Regression of Birth Outcomes, Focus on Prematurity, Thomason Hospital, 1995-1997.

	Model 1	Model 2	Model 3
Nationality/Language (Mexican No English)			
Mexican Some English	0.94	1.00	0.98
Mexican American	1.37 *	1.51 **	1.43 *
Age (20-34)			
Less than 20 Years old	1.69 ***	1.63 **	1.55 **
35 or more Years old	1.53	1.55	1.38
Marital Status (Married)			
Not Married	1.10	1.09	1.02
Years of education (12 or more)			
6 or less	1.00	1.02	0.97
7-11	0.95	0.95	1.05
Household Type (Nuclear)			
Original Family	1.38	1.42	1.32
Extended	0.91	0.89	0.88
Other	1.21	1.21	1.19
Alone/Alone with children	1.36	1.40	1.53
Participate in the labor force (Not working)			
Working	0.87	0.88	0.95
Received WIC (No)		1.14	1.12
Received Food Stamps (No)		0.94	1.00
Unknown		0.76	0.63
Received Medicaid (No)		0.81	0.77
Unknown		0.85	0.89
Sex of the infant (Male)			
Female			0.83
Adequacy of Prenatal Care Index (Adequate)			
Inadequate			4.62 ***
Intermediate			2.09 *
Adequate Plus			16.80***
Loss History (First pregnancy)			
With previous loss			2.36 **
Without previous loss			1.36
Weight Gain (25 lb and more)			
Up to 14 lb			2.92 ***
15 – 24 lb			1.63 **
Unknown			1.32
Parity (First birth)			
Low parity			0.46 *
High parity			0.56
Inter-pregnancy interval (First pregnancy)			
Less than 2 years			1.36
2 to less than 4 years			0.72
4 year or more			1.02
-2*LL	4431.0	4417.5	3958.9

Note: The reference categories are in brackets ( ). The reference group is normal birth outcome.
* p<0.1 ** p<0.05 *** p<0.01

The reference category is “normal birth outcome”, and the other two competing outcomes (IUGR and Heavy Preterm) are shown in Table 6-3 and Table 6-4, respectively.

Model 1 of Table 6-2 shows that Mexican American women have 1.37 times higher odds of prematurity than Mexican women who speak no English, net of sociodemographic factors. In contrast, Mexican women who speak some English do not significantly vary from Mexican women who do not speak English.

Looking ahead to models 2 and 3, it is clear that the prematurity disadvantage for Mexican American women remains moderately strong and statistically significant, even after the complete set of variables is included. Such a disadvantage for the Mexican American women, in comparison to women born in Mexico, is consistent with previous research that shows that nativity is a key distinguishing characteristic for birth outcomes in the United States (Hummer et al. 1999; Landale et al. 2000; Singh and Yu, 1997; Cervantes et al. 1999), with foreign born women showing a clear advantage in most studies.

In turn, the lack of a statistically significant difference between the two groups of Mexican-born women across the three models suggests that acculturation differences among Mexican Origin women is not an important distinguishing characteristic, at least for prematurity. Thus, at least at this point, the evidence suggests that nativity differences among women are critical, and perhaps reflecting the importance of positive health selectivity among the Mexican Origin women; at the same time, language differences among Mexican Origin women are not important. This finding contrast with previous studies that found that the acculturation process leads to a greater risk for adverse pregnancy

outcome (Coonrod et al. 2004). It is possible that a substantial number of Mexican women who went to Thomason Hospital to deliver their babies are not totally immersed in the U.S. acculturation process, either because they still live in Mexico, or because their interactions are concentrated within a close circle of friends and family of Mexican origin.

Looking down the remainder of Table 6-2, there are several important findings to report. Clearly, teenage women are at a disadvantage, at their odds of having a light premature birth are roughly 60 percent higher compared to women who are 20-34 years old. This is a finding that is consistent with other work in this area that has examined maternal age and birth outcomes among Mexican Origin women (Cervantes et al. 1999; Gould et al. 2003; Singh and Yu, 1996). Interestingly, socioeconomic factors show no significant relationship with the odds of light prematurity. That is, maternal education, marital status, household type, employment status and receipt of programmatic income resources do not display any significant relationship with the odds of prematurity. While the non-significance of these factors might come as a surprise to some, especially when these variables have been shown to display relationships with birth outcomes for much work focusing on the general U.S. population (Cohen et al. 1993; Fuentes-Afflick et al. 1999; Kallan, 1993; Singh and Yu, 1996), their non-significant effects among this Mexican Origin population in the U.S. southwest is a paradox in part BECAUSE of the lack of a relationship between such well-known risk factors and health outcomes. Moreover, Weeks et al. (1999) also have not found a significant effect of some key socioeconomic variables at the border. Thus, this set of non-significant findings provides further support that a paradox exists within this border population: that is, the outcomes are generally good, although a heightened risk exists for Mexican American women, and socioeconomic factors are not important predictors of light prematurity.

Model 3 of Table 6-2 goes on to show that a number of biomedical variables are important predictors of light prematurity. Indeed, inadequate and intermediate prenatal care are both associated with higher levels of prematurity. In addition, adequate plus care –which is indicative of a problematic pregnancy (Kotelchuk, 1994a & 1994b)—is also strongly associated with prematurity. Previous pregnancy loss is also strongly associated with prematurity. Together, the effect of "adequate plus" and "previous loss" strongly suggest that women's health is a very strong risk factor for prematurity. This is consistent with previous research that strongly suggested the importance of prenatal care for reducing light preterm births (Balcazar et al. 1991; Hessol and Fuentes-Afflick, 2000). Also, first births are also at higher risk, which is consistent with previous research (Gould et al. 2003; English et al. 1997; Crump et al. 1999). Finally, low weight gain during pregnancy is strongly associated with prematurity, perhaps in part because of reverse causation: that is, prematurity by definition is a shorter pregnancy and does not allow for weight gain through a complete full-term pregnancy. It will be even more interesting to see how weight gain is related to the odds of IUGR in the next table. Despite the effects of these biomedical variables in the expected direction, their inclusion does little to influence the relationship between nativity and prematurity, as Mexican American women continue to show higher odds of prematurity even in the most complete model in the table. Thus, these biomedical variables are not explaining the higher odds of prematurity among Mexican American women. I speculate on the reason for the net effect in the concluding chapter of this dissertation.

In sum, being a Mexican-American mother, being less than 20 years old at the time of delivery, receiving prenatal care other than adequate, having a

previous loss and failure to gain 25 pounds or more during the pregnancy are risk factors for a light premature outcome.

6.2. Intrauterine Growth Retardation Risk Factors

Table 6-3 shows the relationship between nationality/language, sociodemographic factors, income support factors, biomedical factors, and IUGR birth outcomes. Again, the reference category is "normal birth outcome". Model 1 of Table 6-3 shows that, although Mexican women who speak some English have higher odds, there is no significant difference between them, Mexican women who do not speak English, and Mexican American women regarding Intrauterine Growth Retardation outcomes. However, it is worthwhile noting that MSE women have the highest odds ratio (around 36% higher), which could indicate that this type of birth outcome tends to prevail more among these women than among Mexican who do not speak English.

Age of the mother is an important predictor for IUGR, especially for mothers of 35 years of age or older, since their risk is almost three times higher than women whose ages are between 20 and 34 years old. This is consistent with previous studies regarding this variable (English et al. 1997; Singh and Yu, 1996; Kallan, 1993).

The odds ratios for education behave in an unexpected way, because they tend to reduce the risk of having an IUGR outcome in the groups with less education, although these two categories are not statistically distinct from the reference category. However, this situation is somehow expected since most of the women are Mexican and have fewer years of education. Thus, the paradox persists.

Table 6-3: Odds Ratios for Multinomial Logistic Regression of Birth Outcomes, Focus on Intrauterine Growth Retardation, Thomason Hospital 1995-1997.

	Model 1	Model 2	Model 3
Nationality/Language (Mexican No English)			
Mexican Some English	1.34	1.36	1.38
Mexican American	1.07	1.06	1.06
Age (20-34)			
Less than 20 Years old	1.67 **	1.63 *	1.35
35 or more Years old	2.90 ***	2.93 ***	2.93 ***
Marital Status (Married)			
Not Married	0.70	0.68	0.70
Years of education (12 or more)			
6 or less	0.71	0.73	0.68
7-11	0.69	0.71	0.71
Household Type (Nuclear)			
Original Family	0.68	0.63	0.59
Extended	0.78	0.75	0.72
Other	0.52	0.51	0.44
Alone/Alone with children	0.76	0.76	0.79
Participate in the labor force (Not working)			
Working	1.27	1.32	1.32
Received WIC (No)		0.84	0.96
Received Food Stamps (No)		0.62	0.64
Unknown		0.70	0.66
Received Medicaid (No)		1.56	1.64
Unknown		1.38	1.34
Sex of the infant (Male)			
Female			1.31
Adequacy of Prenatal Care Index (Adequate)			
Inadequate			2.09 ***
Intermediate			1.62
Adequate Plus			3.12 ***
Loss History (First pregnancy)			
With previous loss			1.02
Without previous loss			1.21
Weight Gain (25 lb and more)			
Up to 14 lb			3.61 ***
15 – 24 lb			2.44 ***
Unknown			1.84 **
Parity (First birth)			
Low parity			0.75
High parity			1.00
Inter-pregnancy interval (First pregnancy)			
Less than 2 years			0.73
2 to less than 4 years			0.47
4 year or more			0.71
-2*LL	4431.0	4417.5	3958.9

Note: The reference categories are in brackets ( ). The reference group is normal birth outcome.
* p<0.1 ** p<0.05 *** p<0.01

Moreover, marital status, the type of household, and labor force participation have no significant influence on the chance of having an IUGR outcome since the odds ratios are not statistically different from one. Nevertheless it is worth noting that a woman living alone or only with her children tends to reduce her risk of having an IUGR outcome.

Model 2 also includes programmatic aid from government agencies like WIC and food stamps, and the direction of the odds ratios are what was expected; however, they are not statistically significant. As noted before, Mexican-born women have less usage of this type of income support than U.S.-born Mexican American mothers, which is consistent with previous work (Echevarria and Frisbie, 2001), so they would be expected to present higher odds ratios, but it is not the case. This phenomenom is also consistent with the paradox because it has been documented that women that received the WIC program reduced their chances of intrauterine growth retardation outcomes (Frisbie et al. 1997).

Model 3 on Table 6-3 includes the set of biomedical variables as predictors for IUGR outcomes. Age under 20 years old became statistically non-significant, although it shows an odd ratio greater than one. Inadequate and adequate plus prenatal care are both highly associated with intrauterine growth retardation, increasing the risk up to more than 200% for the latter. Moreover, the women who did not gain more than 25 pounds during the pregnancy are also at higher risk to have an IUGR infant than those who gained at least 25 pounds, with the odds ratios representing more than double and triple, respectively, the risk of having such an outcome. These findings are consistent with previous studies that found that the likelihood of a woman giving birth to an IUGR infant was greatly increased when prenatal care was not adequate, or when weight gain was 15 pounds or less (Frisbie et al. 1997; Collins and Shay, 1994; Kallan, 1993). Parity

and pregnancy interval showed no significant effects on intrauterine growth retardation outcomes with respect to first pregnancy, which contrasts with the study by Lang et al. (1996), who found that first births have higher preterm and small for gestational age birth outcomes.

In sum, women who were 35 years old or more at the time of delivery, who received inadequate or adequate plus prenatal care, and who did not gain at least 25 pounds during the pregnancy are at higher risk of having an IUGR infant. In this case, nationality/language has no significant influence on this type of birth outcome.

6.3. Heavy Preterm Risk Factors

Table 6-4 presents the relationship between nationality/language, sociodemographic factors, income support factors, biomedical factors, and heavy preterm birth outcomes. As previously noted, the reference category is "normal birth outcome". Model 1 on Table 6-4 shows that being a Mexican-American mother increases the chances of having a heavy preterm outcome by 40% in comparison to Mexican women who speak no English. Frisbie et al. (1997) found that heavy preterm was more likely among Mexican Americans than among the Anglo population. There is no significant difference among the two categories of women born in Mexico.

Table 6-4: Odds Ratios for Multinomial Logistic Regression of Birth Outcomes, Focus on Heavy Preterm, Thomason Hospital 1995-1997.

	Model 1	Model 2	Model 3
Nationality/Language (Mexican No English)			
Mexican Some English	1.27	1.31	1.22
Mexican American	1.40 **	1.46 **	1.43 **
Age (20-34)			
Less than 20 Years old	1.50 **	1.52 **	1.38 *
35 or more Years old	1.24	1.25	1.17
Marital Status (Married)			
Not Married	0.91	0.90	0.83
Years of education (12 or more)			
6 or less	1.34	1.35	1.32
7-11	0.94	0.95	1.01
Household Type (Nuclear)			
Original Family	0.84	0.85	0.77
Extended	0.93	0.92	0.90
Other	0.86	0.84	0.78
Alone/Alone with children	0.75	0.75	0.74
Participate in the labor force (Not working)			
Working	0.96	0.96	0.98
Received WIC (No)		0.75 *	0.76 *
Received Food Stamps (No)		1.38	1.36
Unknown		1.28	0.80
Received Medicaid (No)		0.77	0.73
Unknown		0.79	1.10
Sex of the infant (Male)			
Female			0.66 ***
Adequacy of Prenatal Care Index (Adequate)			
Inadequate			5.06 ***
Intermediate			1.42
Adequate Plus			16.98 ***
Loss History (First pregnancy)			
With previous loss			1.11
Without previous loss			0.86
Weight Gain (25 lb and more)			
Up to 14 lb			2.19 ***
15 – 24 lb			1.37
Unknown			1.28
Parity (First birth)			
Low parity			1.56
High parity			2.13
Inter-pregnancy interval (First birth)			
Less than 2 years			0.66
2 to less than 4 years			0.52
4 year or more			0.41 *
-2*LL	4431.0	4417.5	3958.9

Note: The reference categories are in brackets ( ). The reference group is normal birth outcome.
* p<0.1 ** p<0.05 *** p<0.01

Age is also an important factor in predicting heavy preterm outcomes; teenager mothers present about 50% higher odds of delivering a heavy preterm infant, while infants born to mothers of 35 years or more of age are not statistically different from those whose mothers who were 20 to 34 years of age. As with the other compromised outcomes, being married or living with a partner has no significant effect on heavy preterm.

Likewise, type of household is not associated with heavy preterm, since none of the categories showed a significant difference with the reference category, nuclear household. The same can be affirmed regarding working conditions, because participation in the labor force is not statistically different from 'not working'.

Model 2 on Table 6-4 adds the variables for income support. The WIC program shows a protective effect against the heavy preterm outcome, since it reduces the odds of such a compromised outcome by 25%. This finding is consistent with previous research that found that the WIC program is beneficial for the health of infants (Frisbie et al. 1997) because it reduces the risk of all adverse birth outcomes. The Food Stamps program has an odds ratio greater than one as expected (since the people in such program are in financial need), although it is not significant. The Medicare program also shows an effect in the expected direction, but is statistically not significant. Similar findings were reached by Frisbie et al. (1997) for those who received public assistance.

Also on Table 6-4, the biomedical variables are included in Model 3. Female infants are at less risk of being heavy preterm, which is consistent with some previous studies that show that female infants are less likely to born preterm (Frisbie and Song, 2003; Frisbie et al. 1998).

Adequate prenatal care is also very important in preventing heavy preterm births. Those women who received inadequate or more than adequate prenatal care are at very high risk of having such a compromised outcome --more than five times the odds in comparison with those who had adequate prenatal care. Again, this is consistent with most of the studies that indicate the importance of prenatal care to avert this, or any, type of compromised outcome (Frisbie et al. 1997; Frisbie et al. 1998; Albrecht et al. 1996). However, the very high odds ratio shown for the adequate plus category suggests that such women are very high risk and receiving extra prenatal care. In this case, intermediate prenatal is not statistically different from adequate care.

Loss history has no statistically significant effect on heavy preterm, but the direction of the odd ratios is what it was expected. Weight gain, on the other hand, indicates that those mothers who fail to gain at least 15 pounds or more are more than twice as likely to have a heavy preterm outcome in comparison to those who gain 25 pounds or more. This finding contrasts with the result obtained by Frisbie et al. (1997), who did not find significant differences between those women who gain 15 pounds or less and those who gained 15 to 40 pounds during pregnancy.

Parity did not show a statistically important effect, although the category high parity has an odds ratio of more than 2. Other studies also have fail to find an association between parity and compromised birth outcomes (Fuentes-Afflick et al. 1999).

In sum, the data from this survey can support only some of the hypotheses stated above. Infants born to Mexican-American women are significantly more

likely to be light preterm, either with enough or without enough weight at the moment of the delivery. Age is associated with all three compromised birth outcomes. Being less than 20 years old, or 35 or more years old, represents a risk factor for low birth weight and a pregnancy of less than 37 weeks of gestational time. Singh and Yu (1996) found similar results when comparing pregnancy outcomes of foreign-born with US-born mothers, concluding that births to mothers 19 years of age or younger and 35 years or older are associated with increased risks of low birth weight and preterm birth.

Among the variables that did not show a significant effect is the existence of a husband/partner in the household. At this point, I can only speculate about the reason for this finding. It is possible that the social background of these women influence this non-effect. Perhaps society has given too much importance to living with a male spouse. Perhaps many women know what to do during their pregnancy, and they do it, with or without requiring help from her partner. If they do not know what to do or how to react to a specific situation during the pregnancy, chances are that neither does the partner. Similar reasoning can be argued about education; living in an urban area such as El Paso-Juarez can imply that formal knowledge (learned in school classrooms) can be acquired from other women, either at home or in another social sphere. In fact, this is consistent with the results obtained by Weeks et al. (1999), where they concluded that education is not itself a relevant factor to explain the differences.

Working conditions is a factor that should be interpreted very carefully. As mentioned before, it can play a role going both ways, against and in favor of adverse birth outcomes. For this group of women, only ‘standing up’ presents a difference that is statistically significant from ‘not working’, by protecting the outcome from being an IUGR. Data did not show more risks for these women,

although we cannot forget that they show a rather low economic participation rate.

Of all the government programs included in the questionnaire, the only one that was designed specifically to promote mother's and new baby's health (the WIC program) is shown to fulfill its goals with women who went to Thomason Hospital, at least with reference to heavy preterm. Frisbie et al. (1997) also found that the WIC program was important to prevent IUGR and Heavy Preterm infants, but was not conclusive regarding preterm outcomes; in fact, they concluded that the odds of prematurity were higher if the medical costs of delivery were paid by a governmental source. Since the other three programs are not necessarily focused on issues related to pregnancy, they had less impact on preventing compromised outcomes. The hypothesis about government programs and their helpfulness was only partially supported.

Perhaps the most direct factors that could affect the birth outcome included in this research were those related to the biomedical history of the mother. It seems natural and logical that the baby's birth weight and gestational time are more directly determined by the mother's pregnancy history, or even more directly by prenatal care received and/or a proper weight gain by the mother during her pregnancy. In sum, some of the hypotheses for biomedical factors were supported. Perhaps the most important is that prenatal care plays a very important role in giving birth to a baby weighing more than 2,500 grams and with more than 37 weeks of gestational time. It was significant in relation to all three types of compromised outcomes. For those mothers who received adequate plus prenatal care, physicians should be prepared, and prepare the woman, to face a compromised outcome, particularly a light preterm or a heavy preterm outcome. This is not surprising because in the literature reviewed for this subject, there is a

consensus about the importance of adequate prenatal care and its protective effects on birth outcomes (Frisbie et al. 1997; Hessol and Fuentes-Afflick, 2000; Kotelchuck, 1994b).

A previous loss indicates a higher risk for the light preterm outcome, while weight gain proved to be one of the most important variables to watch during the pregnancy, because low weight gain (14 pounds or less) represents a risk for compromised outcomes. Low parity is protection against compromised outcomes, compared with first births. Finally, birth intervals of 4 years or more are significant for preventing heavy preterm outcomes.

CHAPTER 7: CONCLUSIONS

This dissertation examined birth outcomes for the Mexican-origin population in El Paso, Texas. A conceptualization of nationality/language was constructed among Mexican-origin women to analyze such a relationship and to study this particular aspect of the well-known epidemiologic paradox.

Mexican-born women have used Thomason Hospital in El Paso, Texas, to deliver their babies for many years. Many have obtained legal residence in the U.S., while some others may not have; and some others just cross the border to get there with the simple objective of obtaining U.S. citizenship for the child. This has been known for years (Ojeda and López, 1994; Guendelman and Jasis, 1992). However, this situation enabled us to study another aspect of the epidemiologic paradox, since we can look at women who are not embedded in the American culture at all, but share many factors with those who are living in the United States.

I presented their birth outcomes divided into four categories based on birth weight and gestational length, as suggested by the literature regarding this subject. Mexican-born women, regardless of their ability to speak English, had relatively more babies whose weights were more than 2500 grams and whose gestational time went on for at least 37 weeks than did Mexican-American women. In fact, taking just the place of birth of the women, being Mexican-American can statistically be considered a risk factor for Light Preterm and for Heavy Preterm. Only for Intrauterine Growth Retardation was there no significant difference between Mexican American and Mexican women; in this category, Mexican mothers who speak some English were characterized by the highest percentage of IUGR births.

One important aspect of the Mexican-born women included in this study is that they are implicitly selected. There are many women on the Mexican side of the border who cannot cross to the United States simply because of lack of proper documents. The U.S. consulate services select the people who will receive a visa based on a complex set of characteristics; usually, people of low socioeconomic status are denied visas to cross the border. That is, people with better economic conditions are those who are more likely to be accepted to go to the United States[14]. Then, among these persons, another selectivity process takes place, because only some go to El Paso to deliver their infant, and among them, just a fraction goes to Thomason Hospital. This situation tends to reinforce the idea that selectivity is important to understand the Hispanic epidemiologic paradox.

7.1. Summary of Results

Descriptive analysis showed that sociodemographic characteristics for Mexican-born women were more favorable than for Mexican-American women, so that less compromised birth outcomes were expected for the first group. In almost every aspect, Mexican-American women were in the categories that were considered high risk; for example, a larger proportion of them were still teenagers, lowering the average age at delivery. Also, a lower percentage were married or living with a partner, while a larger proportion were living at their parents' home, alone, or 'alone with her children'. Moreover, Mexican-Americans presented a higher level of economic activity; this implied that a larger proportion were subjecting themselves to occupation-related risks such as working standing up

[14] According to the Department of State of the United States of America, www.unitedstatesvisas.gov , the necessary documents to obtain a visa are a valid passport, appropiate applications, documents to support the application detailing employment, reason to travel and financial status. Proof of payment of fees is also included.

and/or walking. The only variable that suggested a better situation for Mexican-Americans was years of education, where almost one-half of them completed 12 years of education or more, by far many more years than Mexican-born women.

With respect to nationality/language, the analysis showed that Mexican-American women are more likely to have either a light preterm or a heavy preterm infant than Mexican-born mothers. In general, there are no significant differences between Mexican mothers who speak some English and Mexican mothers who do not speak English for any compromised outcomes. One of the main risks for compromised birth outcomes is becoming a mother at a young age, and Mexican-American presented the largest proportion of mothers of less than 20 years old. Another key factor is prenatal care, since receiving other than adequate is a risk for all compromised birth outcomes. As previous studies report, Mexican-origin mothers usually have lower rates of adequate prenatal care.

The regression analysis also showed that only a few variables were statistically significant when they were included as predictors of birth outcomes. Age was important for compromised outcomes, since the risk increased significantly for women who were not in the age group 20-34. In particular, teenage mothers represented a higher risk of having any of the compromised outcomes. Mexican-American women on average had a larger proportion of adolescents than Mexican-born mothers.

On the other hand, being married or being single did not predict compromised outcomes. Moreover, level of education also failed to make a difference for compromised birth outcomes. As mentioned before, perhaps many women make up for the lack of formal education through other sources of knowledge, such as relatives, friends, other groups of people, etc. Participation in

the economic labor force helped only when the job was carried out by standing up, and just for Intrauterine Growth Retardation. This could indicate reverse causation; that is, healthy women may have continued to work during pregnancy.

Regarding the government programs of social assistance, the WIC program, which is designed specifically for pregnant women and small children, demonstrated its importance in reducing the risk of heavy preterm outcomes among the population in El Paso. Receiving Food Stamps, a program to fight poverty, did not do well in preventing compromised birth outcomes, nor did Medicaid, although its objectives are not directly related to improved birth outcomes. The WIC program is certainly important, but perhaps its importance was not totally reflected due to the fact that the number of people that receive this type of help in this survey was too small. If we could analyze all the people that receive such support and make a comparison with those who do not receive it, controlling for other factors, chances are that we could find further important differences in their birth outcomes.

Although behavioral factors were left out of the multinomial logistic analysis, it is surprising that the smoking and alcohol variables were not found to be risk factors for any of the compromised birth outcomes. The explanation that I consider most feasible is that, again, the number of women who answer yes to these questions was understated. Nevertheless, Mexican-American mothers admitted that they smoke more and drink more than Mexican-born women. For those who were married, husbands or partners of Mexican-American smoked in a larger proportion than those of Mexican-born women in this study. Moreover, the questionnaire did not ask about these risk behaviors during the pregnancy, except for the question about maternal smoking during the pregnancy. But it did not address the number of cigarettes smoked per day.

The variables included among the biomedical factors essentially were consistent with expectations, since most of them helped determine relative risk for light preterm babies. They show strong significance for most of the categories. The adequate prenatal care index developed by Kotelchuck is an excellent predictor of the risk of compromised outcomes. In every variable of the pregnancy history of the woman, i.e., loss history, parity, and birth interval, Mexican-American women are at a disadvantage compared with Mexican-born women, since they have more previous loss, have less low parity, and they were more likely to be having their first child. In terms of maternal weight gain, mothers born in Mexico also present a higher percentage in the groups that tend to represent less risk for compromised birth outcomes.

7.2. Policy Implications

After analyzing all of this information, a number of actions can be implemented to reduce the number of compromised birth outcomes. All of them have something to do with information received before getting pregnant. First, actions should be directed to those aspects that Mexican-born women have that are favorable to normal outcomes. The 'acculturation' process should be reverted at least in those aspects that affect the health status of the mother and the future child. The actions should start with the adolescent population; since being a teenager is particularly risky for all compromised outcomes, a more assertive sexual education and contraceptive use program directed to this population, not only women, but men also, could help to reduce the number of pregnant teens. Currently, campaigns are more focused on preventing sexually transmitted diseases rather than preventing undesired pregnancies. It may seem obvious, but

for the vast majority of these young mothers it is their first baby, which is also a risk factor.

As seen in the data, many of these young women were living with their parents, from whom they possibly had wanted to hide their pregnancy, delaying the onset of prenatal care and/or proper medical attention. By reducing teen pregnancy, the average age would increase, proportionally more babies would be born to mothers between 20 and 34 years of age, the number of mothers that would hide their pregnancy would be reduced, and professional prenatal care would be sought more openly. As for women 35 years old or more, it is important to let them know that they are at higher risk for some compromised outcomes, and special attention should be placed on such women during pregnancy. This information must be given even before the woman reach the age of 35, or at any age for that matter, and the mean could be accomplished through mass media (radio and TV ads, newspaper, magazines, etc.). As long as more Mexican-Americans are inserted in such dynamics, the gap with Mexican-born mothers may close.

Government support should continue through institutions like the WIC program. This is an excellent social program in which women can obtain information regarding contraception use and birth spacing. It is so important to educate the population about the risk factors that could affect the baby's condition at birth. They should know that a previous loss, for example, implies the risk of having a preterm baby, and that waiting at least two years to have another baby increases their chances of having a normal outcome. They should also know that even if they did not receive prenatal care from the beginning of the pregnancy, it is better to have intermediate prenatal care than inadequate or none at all.

7.3. Limitations of the Research

It is important to recall that this study is limited to those women who agreed to answer the questionnaire. It cannot be generalized to the whole Mexican origin population in El Paso, Texas. Moreover, it refers to only those women who agreed to respond to the questionnaire. More important is that the women who attended Thomason Hospital have a particular profile, which is the population that seeks medical attention through this county hospital, not from any other medical center, private or public. Also important is the fact that some variables were not able to show the expected effect on birth outcomes; such cases include the variables smoking and drinking, perhaps due to the nature of the population and their particular situation. Mexican origin women tend to smoke and drink less than the average population, and if we add that we have a limited number of every particular compromised outcome, the sample becomes too small for detailed analysis.

Another important limitation is that the data are based on what the women answered. It is possible that some women answered specific questions with something different than the truth, either because of ignorance or because of fear. For example, maternal weight gain should be based on weight at the beginning of the pregnancy, information that is possible that may not have been known.

Analysis of the Mexican culture and its influence on birth outcomes should continue with a different methodology, perhaps with focus groups and/or in-depth interviews with the Mexican origin population and with women representing all principal ethnicities. The Mexican-born population could learn to use the health service structure to reduce their chances of compromised birth outcomes, and Mexican Americans (and the rest of the population in the U.S.) should know the disadvantage of some behaviors and the advantage of strong ties

with other family members and the importance of waiting until after adolescence to start their reproductive process. Once society learns that the risks of having a compromised outcome can be reduced to minimum, and takes the necessary steps to do it, studies like this will be unnecessary.

Appendix

Questionnaire
(In English and Spanish)

Third Version

WOMEN'S MATERNAL HEALTH SURVEY
Thomason Hospital
El Paso, Texas

INTERVIEWER: _____

WOMAN'S NAME AND SURNAMES:

Name(s) Paternal Surname Maternal Surname

HOSPITAL PATIENT NUMBER: _____

	Day	Month	Year
Date of Admission/Hospitalization:			
Date of Interview:			
Date of Baby's Birth:			

1	What language do you usually speak at home?	Spanish	1
		English	2
		Both	3
2	Considering your abilities in understanding, speaking, reading, and writing, which of these phrases best describes your abilities in Spanish?	Don't know Spanish	1
		Much better in English	2
		Better in English	3
		No difference in either language	4
		Better in Spanish	5
		Much better in Spanish	6
		Don't know English	7
3	To what racial or ethnic group do you feel you belong?	Hispanic or Latino	1
		African-American/Black	2
		Asian/Pacific Island	3
		American Indian	4
		White	5
		Other (specify)	6

SECTION I: SOCIOECONOMIC INFORMATION

101	When were you born?	Day	Month Year
102	With whom do you currently live? **CIRCLE ALL THAT APPLY** **If number one was not selected, go to question #105**	Husband/partner (➔ **#103)** Children Father Mother Brother/sister Other relative Other non-relative Alone	1 2 3 4 5 6 7 8
103	Since when have you been living with your current husband/partner?		Month Year
104	Is the husband/partner with whom you are currently living your first husband/partner?	Yes (➔ #109) No (➔ #108)	1 2
105	Have you ever lived with the father of the child(ren) that you have just had?	Yes No (➔ #107)	1 2
106	From when to when?	From: To:	Month Year Month Year
107	Have you ever been married or lived as a couple with a man?	Yes (➔ #108) No (➔ #109)	1 2
108	In what month and year did you first get married or begin living as a couple w/a man?		Month Year
109	What is your current marital status?	Single Living together Married Separated/Divorced Widowed	1 2 3 4 5

110	Who provides the income in your household? **Circle all that apply.**	Herself 1 Husband/partner 2 Couple (both) 3 Father/mother 4 Son/daughter 5 Brother/sister/other relative 6 Other non-relative 7 No one 8 No response 9 Government aid 10
110a	Who is the owner of the house where you live? (or who is renting it?)	Herself 1 Husband/partner 2 Couple (both) 3 Father/mother 4 Son/daughter 5 Brother/sister 6 Other relative 7 Other non-relative 8 Other (specify) 9
111	Do you receive WIC?	Yes 1 No 2
112	Do you receive: AFDC? Food Stamps? Medic Aid?	 Yes 1 No 2 Yes 1 No 2 Yes 1 No 2
113	Where were you born?	El Paso 1 Ciudad Juarez 2 Other in Texas 3 Other in Chihuahua 4 Other in USA 5 Other in Mexico 6 Other 7

114	What was the last year of schooling that you completed?	NONE		Ninguno		0
		Grade School	1st	Primaria	1°	1
			2nd		2°	2
			3rd		3°	3
			4th		4°	4
			5th		5°	5
		Junior High	6th		6°	6
		Middle School	7th	Secundaria	3°	7
			8th		2°	8
		High School	9th		3°	9
			10th	Preparatoria	1°	10
			11th	o carrera	2°	11
			12th	técnica	3°	12
		University	13th	Profesional o	1°	13
			14th	carrera técnica	2°	14
			15th		3°	15
		B.A./B.S.	16th		4°	16
		M.A./Profession			5°	17
115	Where did you complete this last year of schooling?					
						Name of School
					El Paso	1
					Ciudad Juarez	2
					Other in Texas	3
					Other in Chihuahua	4
					Other in USA	5
					Other in Mexico	6
					Other	7
116	Did you receive all of your schooling in the same city?				Yes	1
					No	2
				City		
				State		
117	Have you attended school at any time during the last two years?				Yes	1
					No	2
						(Go to section II)
118	From when to when?			From:	Month	Year
				To:	Month	Year

SECTION II: CURRENT PREGNANCY & HEALTH PRACTICES

201	How many weeks did your pregnancy last?		Weeks
202	Prenatal care refers to visits to the doctor, nurse or midwife during your pregnancy NOT just one visit to obtain a pregnancy test.		
	During what month of your pregnancy did you first seek prenatal care? (1st month, 2nd, 3rd, etc.)		Month
203	During this pregnancy, how many times did you seek medical care?		(If response is one or more times, go to #205)
204	Why didn't you seek prenatal care?	Does not think it is necessary	1
		Lack of money	2
		Someone told her it was not necessary	3
		Was afraid that the doctor would tell her something negative	4
		Did not have anyone to watch her children	5
		Did not have transportation	6
	GO TO #207	Other (specify)	7
205	Where did you go or what is the name of the doctor (or nurse or midwife) that you saw the majority of the time for prenatal care? **(If she names more than one, list the names in order of visits)**		Clinic/Hospital
			Doctor
		El Paso	1
		Ciudad Juarez	2
		Other in Texas	3
		Other in Chihuahua	4
		Other in USA	5
		Other in Mexico	6
		Other	7

206	Who recommended this place or this doctor?	Relative 1 Friend 2 Nurse 3 Social Services 4 Midwife 5 Church 6 No one/herself 7 Other: 8 (specify)
207	During this pregnancy, were you exposed to chemicals or toxic materials? Where? What materials?	Yes 1 No 2 Don't know 3
208	During this pregnancy, did you have a health problem or accident that worried you?	Yes 1 No 2 (➔ #210)
209	For each of these problems, would you please tell me what they were, in what month of the pregnancy they occurred, and whether or not you consulted a doctor about them?	
	Health problem #1: Month(s) of pregnancy: Consulted a doctor: Who?	Yes 1 No 2 Doctor Clinic/Hospital El Paso 1 Ciudad Juarez 2 Other in Texas 3 Other in Chihuahua 4 Other in USA 5 Other in Mexico 6 Other 7

	Health problem #2:	
	Month(s) of pregnancy:	
	Consulted a doctor:	Yes 1 No 2
	Who?	Doctor
		Clinic/Hospital El Paso 1 Ciudad Juarez 2 Other in Texas 3 Other in Chihuahua 4 Other in USA 5 Other in Mexico 6 Other 7
	Health problem #3:	
	Month(s) of pregnancy:	
	Consulted a doctor:	Yes 1 No 2
	Who?	Doctor
		Clinic/Hospital El Paso 1 Ciudad Juarez 2 Other in Texas 3 Other in Chihuahua 4 Other in USA 5 Other in Mexico 6 Other 7
210	During this pregnancy, did you have a problem with your family, with your husband/partner, or with someone at work which especially affected you?	with husband/partner 1 with other relative 2 with the boss at work 3 with a (some)co-worker(s) 4 No, with no one 5

211	During this pregnancy, how many times a week did you:	eat meat? ____ eat fish? (per month) ____ eat eggs? ____ drink milk? ____
211a	How much weight did you gain during this pregnancy?	Kilograms (kg) ____ Pounds (lb.) ____
212	During this pregnancy, did you take prenatal vitamins?	Yes 1 No 2 (➔ #214)
213	In what month of your pregnancy did you begin to take prenatal vitamins? (1st month, 2nd month, etc.)	____ month
214	During this pregnancy, did you take any medicine without a doctor's prescription? ("over the counter") **specify up to 3**	Yes 1 No 2 ____ ____ ____
215	During this pregnancy, did you take any medicine with a doctor's prescription? ("over the counter") **specify up to 3**	Yes 1 No 2 ____ ____ ____
216	If you took prescribed medicine, who prescribed it?	Doctor Clinic/Hospital El Paso 1 Ciudad Juarez 2 Other in Texas 3 Other in Chihuahua 4 Other in USA 5 Other in Mexico 6 Other 7

217	Have you ever smoked?	Yes ..... 1 No ..... 2 (➔ #220)
218	Did you smoke during this pregnancy?	Yes ..... 1 No ..... 2 (➔ #220)
219	How many cigarettes per day?	number
220	Did your husband smoke during this pregnancy? (if married)	Yes ..... 1 No ..... 2 (➔ #221a)
221	How many cigarettes per day?	number
221a	Did anyone else in your home smoke?	Yes ..... 1 No 2
222	Did you use any type of drug during this pregnancy? What drug?	Yes ..... 1 No 2
223	Does your husband use any type of drug? (if married) What drug?	Yes ..... 1 No 2
224	Do you drink (beer, wine, or some other type of alcoholic beverage)?	Yes ..... 1 No ..... 2 (➔ #227)
225	Did you drink during your pregnancy?	Yes ..... 1 No ..... 2 (➔ #227)
226	How many drinks per week?	number
	If not married or living together: **GO TO SECTION III.**	
227	Does your husband drink (beer, wine, or some other type of alcoholic beverage)?	Yes ..... 1 No ..... 2 (➔ #230)

228	How many drinks per week?		number
229	Have you had problems related to your husband's drinking?	Yes No	1 2
230	Is your husband/partner currently working?	Yes No	1 (➔ #232) 2
231	Since when has he been without work?	Month: Year:	
232	What is (was) the position your husband/partner held in the company or establishment where he works (worked)?	Agricultural worker Public service worker (waiter, elevator operator, cook, etc.) Employed at a commercial business or store Owner of a small business Factory worker (laborer, maintenance, etc.) Technician or supervisor in a factory Service technician for public (home electrical repairs or installations, etc.) Driver (taxis, buses, trucks) Construction worker (painter, bricklayer, carpenter, etc.) Self-employed: Other: specify:	1 2 3 4 5 6 7 8 9 10 11

SECTION III: BIRTH HISTORY

Now I would like to ask you some questions about your pregnancies:

301	How many times have you been pregnant in your whole life (including this last pregnancy)?	
302	Of these pregnancies, how many abortions, miscarriages or stillbirths have you had? (including this last pregnancy)	abortions: miscarriages: stillbirths:
303	In total, how many children have you had that were born alive? Including this last pregnancy)	
304	How many of these children are male?	
305	How many of these children are female?	
306	How many are still alive? **INTERVIEWER NOTE: If the sum of live births, abortions and still births is not equal to the number of pregnancies, ask about multiple births.**	
307	Did you change your place of residence during your pregnancy?	Yes ..... 1 No 2
308	From where to where? **IF THIS IS HER FIRST PREGNANCY GO TO SECTION IV.**	Within El Paso ..... 1 Within Ciudad Juarez ..... 2 Other: ..... 3 From: City State To: City State
308a	Where do you live?	El Paso ..... 1 Ciudad Juarez ..... 2 (➔ 309) Other ..... 3 City State (➔ 309)

308b	If you live in El Paso, what is your zip code?	zip code:
309	What was the result of the pregnancy before this? Mark all options that apply.	Live Birth 1 Twins 2 Triplets 3 (➔ #312) Stillborn 4 Miscarriage/Abortion 5
310	On what date did your previous pregnancy end?	Month Year
311	How many months pregnant were you at that time?	number of months
	IF THE CURRENT BABY IS THE ONLY <u>LIVE BIRTH</u> SHE HAS HAD, GO TO SECTION IV; IF NOT, ASK ABOUT THE BABY BEFORE THAT (born alive).	
312	When was this child born? (the previous live birth)	Month: Year:
313	How many weeks had you been pregnant when this child was born?	number of weeks
314	Was it a boy or a girl?	Boy 1 Girl 2
315	During what month of this pregnancy did you first seek prenatal care? (1st, 2nd month, etc.)	Month
316	During this pregnancy, how many times did you seek medical care?	number of times
317	Who attended the birth of this child?	Doctor 1 Nurse 2 Midwife 3 Other 4

318	Where was this previous child born?	Hospital/Clinic El Paso 1 Ciudad Juarez 2 Other in Texas 3 Other in Chihuahua 4 Other in USA 5 Other in Mexico 6 Other 7
319	Where did you register the birth of your previous child?	El Paso 1 Ciudad Juarez 2 Other in Texas 3 Other in Chihuahua 4 Other in USA 5 Other in Mexico 6 Other 7
320	How much did this (previous birth) child weigh at birth?	lbs. and oz. kilogramos
321	Did you breastfeed this child?	Yes 1 (➔ #323) No 2
322	Why didn't you breastfeed this child?	mother ill/weak 1 child ill/weak 2 child premature 3 nipple/breast problems or pain 4 insufficient milk 5 mother working 6 child refused 7 mother taking medication 8 Herself 9 Other 10 Specify (➔ #328)

323	Who advised you to breastfeed the child?	Doctor	1
		Nurse	2
		Midwife	3
		Herself	4
		Other	5
		Specify	
324	How long did you breastfeed the child?	Months	Years
325	At what age did you begin to give the child foods (including formula) other than mother's milk?	Weeks	
		Months	
		Years	
326	Were you able to breastfeed the child the entire time that you wished to breastfeed her or him?	Yes	1 (➔ #328)
		No	2
327	Why not?	Mother ill/weak	1
		Child ill/weak	2
		Child premature	3
		Nipple/breast problems or pain	4
		Insufficient milk	5
		Mother working	6
		Child refused	7
		Mother taking medication	8
		Other	9
		Specify	
328	Is this child still living?	Yes	1 (➔ #334)
		No	2
329	When did the child die?	Month	Year
330	Where did you register the child's death?	El Paso	1
		Ciudad Juarez	2
		Other in Texas	3
		Other in Chihuahua	4
		Other in USA	5
		Other in Mexico	6
		Other	7

331	Was this child seen by a doctor during the time (s)he had the illness that caused his/her death?	Yes ..... 1 No ..... 2 (➔ #333) No response ..... 3 (➔ #333)
332	Where was (s)he seen during the illness?	Hospital/Clinic El Paso ..... 1 Ciudad Juarez ..... 2 Other in Texas ..... 3 Other in Chihuahua ..... 4 Other in USA ..... 5 Other in Mexico ..... 6 Other 7
333	What was the main cause of the child's death?	Infectious or parasitic illness ..... 1 Respiratory illness ..... 2 Infections originated during the prenatal period ..... 3 Congenital anomalies ..... 4 Trauma or poisoning ..... 5 Other ..... 6 Specify (Go to Section IV)
334	Who is taking care of this child at this moment?	Child is alone ..... 1 Father of the child ..... 2 Other relative ..... 3 Friend ..... 4 Older children ..... 5 Neighbors ..... 6 Day care ..... 7 Domestic servant ..... 8 Child at school ..... 9 Other ..... 10 Specify

335	Where is (s)he at this moment?	El Paso	1
		Ciudad Juarez	2
		Other in Texas	3
		Other in Chihuahua	4
		Other in USA	5
		Other in Mexico	6
		Other	7

SECTION IV: WORK

O.K., now I would like to ask you about your work, that is, work in addition to housework, and for which you probably, although not necessarily, receive some type of pay.

401	Have you worked at any time after the birth of your previous child? (or during the last two years if this is your first birth)	Yes No	1 2 (Go to Section V)
402	From when to when? NOTE: questions 403 to 410 are about the last job (within the last 2 years or since the birth of her previous child)	From: To:	Month Year Month Year
403	What kind of business is conducted at your place of work?		
404	What is (was) the name of the occupation, profession, position, or post, that describes your work?		
405	At work are you normally:	Seated Standing Walking Other Specify	1 2 3 4
406	Do you have to move heavy objects that requires strength at work?	Yes No	1 2
407	Do you use protective gear or clothing at work, such as:	Hard-hat Goggles Face mask Protective gloves Belt or girdle Protective shoes Protective clothing (used to cover any part of your body such as your hair or feet) Other accessories Specify	1 2 3 4 5 6 7 8

408	Are you frequently exposed to chemical materials at work (such as glues, paint, soldering materials, etc.), fumes or powders?		Yes ..... 1 No 2
409	Your place of work is:		Outdoors ..... 1 Has air conditioning/heating ..... 2 Has ventilation ..... 3 Does not have AC/heating or ventilation 4
410	Where is the company or establishment where you work(ed) located?		El Paso ..... 1 Ciudad Juarez ..... 2 Other in Texas ..... 3 Other in Chihuahua ..... 4 Other in USA ..... 5 Other in Mexico ..... 6 Other 7

SECTION V: USE OF CONTRACEPTION

501 - 503	Now I would like to ask some questions about family planning - the various methods that a couple can use to delay or avoid pregnancy. **CIRCLE NUMBER 1 IN THE FIRST COLUMN FOR RESPONSES MENTIONED SPONTANEOUSLY. CIRCLE NUMBER 2 IF THE METHOD IS RECOGNIZED WHEN PROBED, OR NUMBER 3 IF THE METHOD IS NOT RECOGNIZED.** **THEN, FOR EACH METHOD WITH A CODE 1 OR 2 IN RESPONSE TO Q502, ASK Q503.**				
	501: Which ways or methods have you heard about? (let her mention the names spontaneously)	**502**: Have you ever heard of (METHOD)? READ THE DESCRIPTION OF EACH METHOD		**503**: Have you ever used (METHOD)?	
a.	PILL a pill that a woman takes every day.	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
b.	IUD a loop or coil that a woman can have placed inside her by a nurse or doctor.	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
c.	INJECTIONS contraceptive injections to prevent pregnancy that can be administered by a nurse or doctor.	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
d.	NORPLANT	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
e.	VAGINAL METHODS such as foams, jellies, creams, and tablets that the woman can put inside herself before intercourse.	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
f.	DIAPHRAGM that a woman can place inside herself before having intercourse.	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
g.	CONDOM that the male can use during intercourse	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
h.	FEMALE STERILIZATION OR LIGATION an operation a woman can have performed to avoid having more children.	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2

i.	VASECTOMY an operation that a man can have to avoid having any more children	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
j.	RHYTHM OR BILLINGS having intercourse during certain days of the month so that the woman will not become pregnant	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2
k.	WITHDRAWAL the man can be careful and pull out before climax.	Yes/Spontaneously Yes/Recognize if questioned No	1 2 3	Yes No	1 2

504	After your previous pregnancy ended (or in the last 2 years if this is her first pregnancy) did you or your husband use a form of contraception or do something specific to avoid pregnancy?	Yes ..... 1 No ..... 2 (Confirm then go to #512)
505	What did you do first or what method did you use to avoid pregnancy?	Pill ..... 1 IUD ..... 2 Injections ..... 3 NORPLANT ..... 4 Vaginal Method ..... 5 Diaphragm ..... 6 Condom ..... 7 Female Sterilization or Ligation ..... 8 Vasectomy ..... 9 Billings (abstinence) ..... 10 Rhythm ..... 11 Withdrawal ..... 12 Don't know ..... 13 Other: ..... 14 Specify
506	Where did you obtain this method for the first time?	NAME (Method) Clinic ..... 1 Hospital ..... 2 Pharmacy 3 El Paso ..... 1 Ciudad Juarez ..... 2 Other in Texas ..... 3 Other in Chihuahua ..... 4 Other in USA ..... 5 Other in Mexico ..... 6 Other 7

507	What was the main reason you stopped using (METHOD)?	Became pregnant while using method	1
		Wanted to become pregnant	2
		Spouse/partner disapproved	3
		Side effects	4
		Worries abou thealth	5
		Access/availability	6
		Wanted more effective method	7
		Inconvenient to use	8
		Infrequent intercourse	9
		Cost	10
		Difficulty becoming pregnant/menopause	11
		Fatalist	12
		Divorced/separated	13
		Other	14
		Specify	
		Don't know/no reason	15
508	Have you used another method or have you done anything after using (1st method) to avoid pregnancy?	Yes	1
		No	2
			(➔ #512)
509	What method did you use after using (1st method)?	Pill	1
		IUD	2
		Injections	3
		NORPLANT	4
		Vaginal Method	5
		Diaphragm	6
		Condom	7
		Female Sterilization or Ligation	8
		Vasectomy	9
		Billings (abstinence)	10
		Rhythm	11
		Withdrawal	12
		Don't know	13
		Other:	14
		Specify	

510	Where did you obtain this method for the first time?		
		Clinic	1
		Hospital	2
		Pharmacy	3
		El Paso	1
		Ciudad Juarez	2
		Other in Texas	3
		Other in Chihuahua	4
		Other in USA	5
		Other in Mexico	6
		Other	7
511	What was the main reason you stopped using (METHOD)?	Became pregnant while using method	1
		Wanted to become pregnant	2
		Spouse/partner disapproved	3
		Side effects	4
		Worries abou thealth	5
		Access/availability	6
		Wanted more effective method	7
		Inconvenient to use	8
		Infrequent intercourse	9
		Cost	10
		Difficulty becoming pregnant/menopause	11
		Fatalist	12
		Divorced/separated	13
		Other	14
		Specify	
	Now I would like to ask a few questions concerning the future.		
512	Would you like to have another child?	Yes	1
		No	2
		Don't know	3
			(➔ #514)
513	How long would you like to wait before the birth of another child?	Less than 2 years	1
		Between 2 and 3 years	2
		Between 4 and 5 years	3
		More than 5 years	4

514	Do you or your husband plan to use a method of contraception in the future?	Yes ..... 1 No ..... 2 (#516)
515	What method do you plan to use?	Pill ..... 1 IUD ..... 2 Injections ..... 3 NORPLANT ..... 4 Vaginal Method ..... 5 Diaphragm ..... 6 Condom ..... 7 Female Sterilization or Ligation ..... 8 Vasectomy ..... 9 Billings (abstinence) ..... 10 Rhythm ..... 11 Withdrawal ..... 12 Don't know ..... 13 Other: ..... 14 Specify
516	When was the last time someone spoke with you concerning contraceptive methods?	Month ____ Year ____ Don't Remember ..... ☐ (check box if she doesn't remember)
517	Who was this person?	Relative ..... 1 Friend ..... 2 Neighbor ..... 3 Doctor ..... 4 Nurse ..... 5 Midwife ..... 6 Pharmacist ..... 7 Clinic worker 8
518	Do you plan to breastfeed the child you just had?	Yes ..... 1 No ..... 2 (→ 520)
519	Until (s)he reaches what age?	Months ____ Years ____

520	Why not?	Mother ill/weak	1
		Child ill/weak	2
		Child premature	3
		Nipple/breast problems or pain	4
		Insufficient milk	5
		Mother working	6
		Child refused	7
		Mother taking medication	8
		Other	9
		Specify	

Interviewer's comments concerning this interview:

WOMEN'S MATERNAL HEALTH SURVEY

Thomason Hospital
El Paso, Texas

ENTREVISTADOR: _____

NOMBRE Y APELLIDOS DE LA MUJER:

Nombre(s) _____ Apellido Paterno _____ Apellido Materno

NUMERO DE LA PACIENTE DEL HOSPITAL: _____

Fecha De Ingreso/Hospitalización:			
	Día	Mes	Año
Fecha de Entrevista:			
	Día	Mes	Año
Fecha del Nacimiento: (del bebé)			
	Día	Mes	Año

1	¿Cual lenguaje habla usualmente en casa?	español inglés ambos	1 2 3
2	¿Considerando su habilidad para entender hablar, leer, y escribir, cual de éstas frases describe mejor sus habilidades en inglés?	No sabe inglés Mucho mejor en español Mejor en español No hay diferencia entre los dos lenguajes Mejor en inglés Mucho mejor en inglés No sabe español	1 2 3 4 5 6 7
3	¿A qué grupo racial o étnico ud. considera que pertenece?	Hispana o latina Americana Africana/Negra Asiática/isleña Pacífica India Americana Blanca Otra raza (especifique)	1 2 3 4 5 6

SECCION I: DIAGNOSTICO SOCIOECONOMICO

101	¿En qué fecha nació usted?	Día	Mes / Año
102	¿Con quién vive ud. actualmente? **(Encierre en un circulo todas las opciones que apliquen)** **Si el número uno no fue seleccionado, pase a p. #105**	Esposo/compañero (➔ **#103**)	1
		Hijos	2
		Padre	3
		Madre	4
		Hermano/hermana	5
		Otra pariente	6
		Otra no pariente	7
		Sola	8
103	¿Desde cuando está viviendo con el esposo/ compañero actual?	Mes / Año	
104	¿El esposo/compañero con quien ud. vive actualmente es su primer esposo o compañero?	Si (➔ #109)	1
		No (➔ #108)	2
105	¿Alguna vez viviste con el padre del (de los) niño(s) que acabas de tener?	Si	1
		No (➔ #107)	2
106	¿De cuándo a cuándo?	De: Mes / Año	
		A: Mes / Año	
107	¿Alguna vez te casaste o viviste en pareja?	Si (➔ #108)	1
		No (➔ #109)	2
108	¿En qué fecha se casó o empezó a vivir en pareja por primera vez?	Mes / Año	
109	¿Cuál es su actual estado civil?	Soltera	1
		Unida	2
		Casada	3
		Separada/Divorciada	4
		Viuda	5

110	¿Quién o quienes sostienen económicamente su hogar? **encierre en un circulo todas las alternativas que apliquen**	Ella misma Esposo/compañero Pareja (los dos) Padre/madre Hijo/hija Hermano (a)/otro pariente Otro no pariente Nadie No respuesta Ayuda del Gobierno	1 2 3 4 5 6 7 8 9 10
110a	¿Quién es el dueño de la casa donde vive? (o quién es el que la renta)	Ella misma Esposo/compañero Pareja (los dos) Padre/madre Hijo/hija Hermano (a) Otro pariente Otro no pariente Otro (especifique)	1 2 3 4 5 6 7 8 9
111	¿Recibe Ud. WIC?	Si No	1 2
112	¿Recibe Ud.: AFDC? Food Stamps? Medic Aid?	Si 1 No 2 Si 1 No 2 Si 1 No 2	
113	¿Dónde nació usted?	El Paso Ciudad Juárez Otro en Texas Otro en Chihuahua Otro en USA Otro en México Otro	1 2 3 4 5 6 7

114	¿Cuál fue el último año de escuela que usted aprobó?	NONE		Ninguno		0
		Grade School	1st	Primaria	1°	1
			2nd		2°	2
			3rd		3°	3
			4th		4°	4
			5th		5°	5
		Junior High	6th		6°	6
		Middle School	7th	Secundaria	3°	7
			8th		2°	8
		High School	9th		3°	9
			10th	Preparatoria	1°	10
			11th	o carrera	2°	11
			12th	técnica	3°	12
		University	13th	Profesional o	1°	13
			14th	carrera técnica	2°	14
			15th		3°	15
		B.A./B.S.	16th		4°	16
		M.A./Profession			5°	17
115	¿Dónde hizo su último año de estudios?					
						Nombre de Escuela
					El Paso	1
					Ciudad Juárez	2
					Otro en Texas	3
					Otro en Chihuahua	4
					Otro en USA	5
					Otro en México	6
					Otro	7
116	¿Estudió siempre en la misma Ciudad?				Si	1
					No	2
				Ciudad		
				Estado		
117	¿Estudió alguna vez durante los últimos dos años?				Si	1
					No	2
						(Pase a sección II)
118	¿De cuándo a cuándo?			De:	Mes	Año
				A:	Mes	Año

SECCION II: EMBARAZO ACTUAL Y HABITOS DE SALUD

201	¿Cuántas semanas duró su embarazo?		Semanas
202	Ciudado prenatal se refiere a visitas al médico, enfermera, o partera durante su embarazo, no sólo a una visita para obtener una prueba del embarazo.		
	¿Durante qué mes del embarazo fue por primera vez a ciudado prenatal? (1° mes, 2° ,3° , etc.)		Mes
203	Durante este embarazo, ¿Cuántas veces fue usted a control médico?		
	(Nota: Si la respuesta es una o más veces, pase a la pregunta #205)		
204	¿Por qué no fue a ciudado prenatal? **(pase a la pregunta #207 después de esta pregunta)**	No cree que sea necesario	1
		No tiene dinero	2
		Alguien le dijo que no era necesario	3
		Tenía miedo que el doctor le dijera algo negativo	4
		No tenía alguien que cuidara de los niños	5
		No podía transportarse	6
		Otro (especifique)	7
205	¿A dónde fue o con quién se atendió la mayor parte de las veces para el Ciudado del embarazo? **(Si nombra más de uno, listar los nombres en orden de asistencia)**		Clínica/Hospital
			Doctor
		El Paso	1
		Ciudad Juárez	2
		Otro en Texas	3
		Otro en Chihuahua	4
		Otro en USA	5
		Otro en México	6
		Otro	7

206	¿Quién le recomendó ese lugar o ese doctor?	Pariente 1 Amiga/amigo 2 Enfermera 3 Servicios Sociales 4 Partera 5 Iglesia 6 Nadie/Ella Misma 7 Otro: 8 (Especifique)
207	¿Durante este embarazo estuvo usted expuesta a materiales químicos o tóxicos? ¿En dónde fue? ¿Cuáles materiales?	Si 1 No 2 No sabe 3
208	Durante este embarazo, ¿Tuvo algún problema de salud o accidente que le haya preocupado?	Si 1 No 2 (➔ #210)
209	Para cada uno de los problemas ¿me podría decir cuáles fueron esos problemas, en qué mes del embarazo ocurrieron, y si consultó a un médico?	
	Problema de salud #1:	
	Mes(es) del embarazo:	
	Consultó a un médico:	Si 1 No 2
	Quién?	Doctor Clínica/Hospital El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7

	Problema de salud #2:	
	Mes(es) del embarazo:	
	Consultó a un médico:	Si 1 No 2
	Quién?	
		Doctor
		Clínica/Hospital El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7
	Problema de salud #3:	
	Mes(es) del embarazo:	
	Consultó a un médico:	Si 1 No 2
	Quién?	
		Doctor
		Clínica/Hospital El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7
210	Durante este embarazo, ¿tuvo algún problema con su familia, con su esposo/compañero, o en su trabajo, que le haya afectado especialmente?	con esposo/compañero 1 con otro pariente 2 con el jefe en el trabajo 3 con un(os) compañero(s) de trabajo 4 No, con nadie 5

211	Durante este embarazo, ¿Cuántas veces por semana usted:	comió carne? ____ comió pescado? (al mes) ____ comió huevos? ____ tomó leche? ____
211a	¿Cuánto peso ganó durante este embarazo?	____ kgs. ____ lbs.
212	Durante este embarazo, ¿tomó vitaminas prenatales?	Si 1 No 2 (➔ #214)
213	¿En qué mes del embarazo empezó a tomar vitaminas prenatales? (1° mes,2°, etc.)	____ Mes
214	Durante este embarazo, ¿tomó medicina sin receta médica ("over the counter")? **especifique hasta 3**	Si 1 No 2 ____ ____ ____
215	Durante este embarazo, ¿tomó medicina con receta médica? **especifique hasta 3**	Si 1 No 2 ____ ____ ____
216	Si tomó medicinas con receta médica, ¿quién se las prescribió?	Doctor Clínica/Hospital El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7

217	¿Alguna vez fumó Ud.?	Si ..... 1 No ..... 2 (➔ #220)
218	¿Fumó Ud. durante este embarazo?	Si ..... 1 No ..... 2 (➔ #220)
219	¿Cuántos cigarrillos por día?	número
220	¿Fumó su esposo/compañero durante este embarazo? (si es casada/unida)	Si ..... 1 No ..... 2 (➔ #221a)
221	¿Cuántos cigarrillos por día?	número
221a	¿Alguien más en su casa fuma?	Si ..... 1 No 2
222	¿Usó Ud. algún tipo de droga durante el embarazo? ¿Cuál?	Si ..... 1 No 2
223	¿Su esposo/compañero usa algún tipo de droga? (si es casada/unida) ¿Cuál?	Si ..... 1 No 2
224	¿Usted bebe (cerveza, vino o alguna otra bebida alcohólica)?	Si ..... 1 No ..... 2 (➔ #227)
225	¿Ud. bebió durante el embarazo?	Si ..... 1 No ..... 2 (➔ #227)
226	¿Cuántas bebidas por semana?	número
	En caso que no sea casada/unida: **PASE A LA SECCION III.**	
227	¿Su esposo bebe? (vino, cerveza, o cualquier otro tipo de bebida alcohólica)	Si ..... 1 No ..... 2 (➔ #230)

228	¿Cuántas bebidas por semana?		número
229	¿Ha tenido usted problemas por la forma de beber de su esposo?	Si No	1 2
230	¿Su esposo/compañero tiene trabajo actualmente?	Si No	1 (→ #232) 2
231	¿Desde cuándo ha estado él sin trabajo?	Mes: Año:	
232	¿Cuál es (era) la ocupación de su esposo/compañero en la compañía o establecimiento donde él trabaja (trabajaba)?	Trabajador agrícola Trabajador en servicios al público (cocinero, mesero, botones, etc.) Empleado en comercio Propietario de pequeño comercio Obrero en fábrica (operario, peón, mantenimiento, etc.) Técnico o supervisor en fábrica Técnico en servicios al público (reparaciones de electro domésticos, instalaciones eléctricas, de seguridad, etc.) Chofer (taxis, buses, camiones) Trabajador en la construcción (pintor, albañil, carpintero, etc.) Trabajador por su cuenta Otro: Especifique:	1 2 3 4 5 6 7 8 9 10 11

SECCION III: HISTORIA DE EMBARAZOS

Ahora le voy a hacer algunas preguntas sobre sus embarazos:

301	¿Cuántas veces ha estado embarazada en toda su vida? (incluyendo este último embarazo)	
302	De esos embarazos, ¿cuántos abortos, pérdidas, o nacidos muertos ha tenido? (incluyendo este último embarazo)	abortos: pérdidas: nacidos muertos:
303	En total, ¿cuántas hijas e hijos nacidos vivos ha tenido? (incluyendo este último embarazo)	
304	¿Cuántos de ellos son hombres?	
305	¿Cuántos de ellos son mujeres?	
306	¿Cuántos de ellos están vivos actualmente? **Nota: Si la suma de nacidos vivos, abortos y nacidos muertos no es igual al número de embarazos, pregunte por embarazos múltiples.**	
307	¿Cambió su lugar de residencia durante su embarazo?	Si ..... 1 No 2
308	¿De dónde a dónde? **SI ESTE ES EL PRIMER EMBARAZO, PASE A LA SECCION IV.**	Dentro de El Paso ..... 1 Dentro de Ciudad Juárez ..... 2 Otro: ..... 3 De: Ciudad Estado A: Ciudad Estado
308a	¿Dónde vive?	El Paso ..... 1 Ciudad Juárez ..... 2 (➔ 309) Otro (especifique) ..... 3 Cuidad Estado (➔ 309)

308b	Si vive en El Paso, ¿Cuál es su zip-code?	zip code:
309	¿Cuál fue el resultado de su embarazo anterior? Marque todas las opciones que apliquen.	Nacido vivo 1 Gemelos 2 Trillizos 3 (➔ #312) Nacido muerto 4 Pérdida/aborto 5
310	¿En qué fecha terminó ese embarazo anterior?	Mes Año
311	¿Cuántos meses de embarazo tenía en ese momento?	número de meses
	SI EL RECIEN NACIDO ES SU ÚNICO HIJO NACIDO VIVO, PASE A LA SECCION IV; SI NO, PREGUNTE ACERCA DEL HIJO ANTERIOR (nacido vivo).	
312	¿Cuándo nació su penúltimo hijo nacido vivo (ese niño)?	Mes: Año:
313	¿Cuántas semanas de embarazo tenía cuando nació?	número de semanas
314	¿Fue hombre o mujer?	Hombre 1 Mujer 2
315	¿Durante qué mes de ese embarazo fue por primera vez a cuidado prenatal? (1° mes, 2° mes, 3° ,etc.)	Mes
316	Durante ese embarazo, ¿Cuántas veces fue usted a cuidado prenatal?	veces
317	¿Quién la atendió a usted durante el parto de ese hijo/a?	Doctor 1 Enfermera 2 Partera 3 Otro 4

318	¿Dónde nació su hijo/a anterior?	Nombre de hospital o clínica El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7
319	¿Dónde registró el nacimiento de su hijo/a anterior?	El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7
320	¿Cuánto pesó su hijo/a anterior al nacer?	libras y onzas kilogramos
321	¿Le dió pecho a ese/a niño/a?	Si 1 (➔ #323) No 2
322	¿Por qué nunca le dió pecho a ese/a niño/a?	Madre enferma/débil 1 Niño/a enferma/débil 2 Niño prematuro 3 Problemas de los pezones/senos/o dolor 4 Sin leche 5 Madre trabajando 6 Niño rechazó 7 Madre tomando medicamento 8 Otro 9 Especifique (➔ #328)

323	¿Quién le aconsejó a Ud. dar el pecho a ese/a niño/a?	Doctor 1 Enfermera 2 Partera 3 Ella misma 4 Otro 5 Especifique
324	¿Por cuánto tiempo le dió pecho a ese/a niño/a?	Meses | Años
325	¿A partir de que edad le empezó a dar otros alimentos diferentes a la leche materna (incluyendo fórmula)?	Semanas Meses Años
326	¿Pudo darle pecho a ese/a niño/a durante el tiempo que usted quiso?	Si 1 (➔ #328) No 2
327	¿Por qué no?	Madre enferma/débil 1 Niño/a enferma/débil 2 Niño prematuro 3 Problemas de los pezones/senos/o dolor 4 Sin leche 5 Madre trabajando 6 Niño rechazó 7 Madre tomando medicamento 8 Otro 9 Especifique
328	¿Está vivo ese/a hijo/a?	Si 1 (➔ #334) No 2
329	¿En qué fecha murió ese/a hijo/a?	Mes | Año
330	¿Dónde registró su muerte?	El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7

331	¿Ese/a hijo/a fue atendido por un médico durante la enfermedad que produjo su muerte?	Si 1 No 2 (➔ #333) No respuesta 3 (➔ #333)
332	¿Dónde fue atendido durante esta enfermedad?	hospital o clínica El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7
333	¿Cuál fue la principal causa de su muerte?	Enfermedades infecciosas o parasitarias 1 Enfermedades del aparato respiratorio 2 Infecciones originadas en el período prenatal 3 Anomalías congénitas 4 Traumatismos o envenenamientos 5 Otro 6 Especifique (pase a la sección IV)
334	¿Quién está cuidando de él/ella en este momento?	Ella misma (está sola/o) 1 El padre del niño 2 Otro pariente 3 Amiga/o 4 Niño(s) mayor(es) 5 Vecinos 6 Guardería infantil 7 Sirviente doméstico 8 Niño está en la escuela 9 Otro 10 Especifique

335	¿Dónde está el/la niño/a en este momento?	El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7

SECCION IV: TRABAJO

Bueno, ahora vamos a hablar un poco de su trabajo, es decir sobre otra actividad que usted realice, además del trabajo de la casa, y por la que probablemente recibe algun tipo de pago (aunque no necesariamente).

401	¿Ha trabajado usted alguna vez después de que nació su hijo anterior? (o durante los últimos dos años si éste es su primer hijo)	Si ..... 1 No ..... 2 (Pase a la sección V)
402	¿De cuándo o cuándo trabajó Ud.? Nota: las preguntas 403 a 410 son acerca del último trabajo (en los últimos 2 años o desde el nacimiento de su hijo anterior)	De: Mes Año A: Mes Año
403	¿Qué tipo de actividad se realiza en la empresa, negocio, institución, etc. donde trabaja(ba) usted?	
404	¿Cuál es (era) el nombre del oficio, profesión, puesto o cargo que describe su trabajo?	
405	En su trabajo, usted está normalmente:	Sentada ..... 1 De pie ..... 2 Caminando ..... 3 Otro ..... 4 Especifique
406	¿En su trabajo, usted tiene que mover objetos pesados, usando su fuerza?	Si ..... 1 No 2
407	En su trabajo, utiliza equipo especial de protección, como...	Casco de protección ..... 1 Lentes de protección ..... 2 Tapa-bocas ..... 3 Guantes de protección ..... 4 Cinturón ..... 5 Zapatos de protección ..... 6 Bata (aunque sea para cubrir cualquier parte del cuerpo, como cabello o pies) ..... 7 Otro aditamento ..... 8 Especifique

408	¿En su trabajo, está Ud. constantemente expuesta a materiales químicos (como pegamento, pintura, material de soldadura, etc.), olores o polvos?	Si No	1 2
409	Su lugar de trabajo:	Es al aire libre Tiene aire acondicionado/calefacción Tiene ventilación No tiene AC/calefacción ni ventilación	1 2 3 4
410	¿Dónde esta localizada la empresa o institución en que usted trabaja(ba)?	El Paso Ciudad Juárez Otro en Texas Otro en Chihuahua Otro en USA Otro en México Otro	1 2 3 4 5 6 7

SECCION V: USO DE ANTICONCEPTIVOS

501-503	Ahora me gustaría hablar sobre planificación familar, o sea las diferentes formas o los diferentes métodos que una pareja puede usar para postergar o evitar un embarazo. **ENCIERRE EN UN CIRCULO EL NUMERO 1 EN LA PRIMERA COLUMNA PARA RESPUESTAS CORRESPONDIENTE A CADA METODO MENCIONADO ESPONTANEAMENTE. ENCIERRE EN UN CIRCULO EL NUMERO 2 SI EL METODO SE RECONOCE, Y EL NUMERO 3 SI NO SE RECONOCE. LUEGO HAGA LAS PREGUNTAS DE LA SEGUNDA COLUMNA CORRESPONDIENTE A CADA METODO DONDE ESTEN LOS NUMEROS 1 Y 2 EN LA PREGUNTA DE LA PRIMERA COLUMNA ENCERRADOS EN UN CIRCULO, ANTES DE SEGUIR CON EL METODO SIGUIENTE.**		
	501: ¿De cuáles métodos ha oído hablar? (deje que ella menciona los nombres espontáneamente)	502: ¿Ha oído hablar alguna vez de (METODO)? LEA LA DESCRIPCION DE CADA METODO	503: ¿Ha usado alguna vez el (METODO)?
a.	PILDORA o pastilla anticonceptiva que las mujeres pueden tomar todos los días.	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2
b.	DIU, espiral o T de cobre que puede ser colocada en la mujer por un doctor o enfermera.	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2
c.	INYECCIONES anticonceptivas para evitar que la mujer quede embarazada y que puede ser aplicada por un doctor o enferma.	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2
d.	NORPLANT	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2
e.	METODOS VAGINALES como espumas, jaleas, cremas, tabletas, que la mujer puede colocarse dentro antes de tener relaciones sexuales	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2
f.	DIAFRAGMA que la mujer puede colocarse dentro antes de relaciones sexuales	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2
g.	CONDON O PRESERVATIVO que los hombres pueden usar durante las relaciones sexuales	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2
h.	ESTERILIZACION FEMENINA O LIGADURA con la cual las mujeres pueden operarse para evitar tener más hijos.	Si/Espontáneamente 1 Si/Reconocido 2 No 3	Si 1 No 2

i.	VASECTOMIA u operación del hombre para no tener más hijos.	Si/Espontáneamente Si/Reconocido No	1 2 3	Si No	1 2
j.	RITMO Y METODO DE BILLINGS Algunas parejas no tienen relaciones sexuales en ciertos días del mes para que le mujer no quede embarazada	Si/Espontáneamente Si/Reconocido No	1 2 3	Si No	1 2
k.	RETIRO el hombre se retira antes de terminar	Si/Espontáneamente Si/Reconocido No	1 2 3	Si No	1 2

504	Después que terminó su embarazo anterior (o en los últimos dos años si la entrevistada sólo ha tenido un embarazo), ¿hizo usted o su esposo/compañero algo para evitar quedar embarazada?	Si ..... 1 No ..... 2 (Asegúrese, y pase a #512)
505	¿Qué fue lo primero que hizo o que método usó para evitar quedar embarazada?	Píldora o Pastilla ..... a DIU (IUD) ..... b Inyecciones ..... c NORPLANT ..... d Métodos Vaginales (jaleas, espumas, cremas etc.) ..... e Diafragma ..... f Condón o Preservativo ..... g Esterilización Femenina o Ligadura ..... h Vasectomía ..... i Método de Billings (abstinencia) ..... j Ritmo ..... k Retiro ..... l No sabe ..... m Otro: ..... n
		especifique
506	¿Dónde consiguió este método por primera vez?	Nombre Clínica ..... 1 Hospital ..... 2 Farmacia 3 El Paso ..... 1 Ciudad Juárez ..... 2 Otro en Texas ..... 3 Otro en Chihuahua ..... 4 Otro en USA ..... 5 Otro en México ..... 6 Otro 7

507	¿Cuál fue la razón principal por la que dejó de usar (método)?	Quedó embarazada 1 Quería quedar embarazada 2 El esposo/compañero desaprobaba 3 Efectos secundarios 4 Le preocupaba su salud 5 Difícil acceso/disponibilidad 6 Quería un método más efectivo 7 Inconveniencia al usarlo 8 Relaciones esporádicas 9 Costos 10 Dificultad para quedar embarazada/menopausia 11 Fatalismo 12 Divorcio/separación 13 Otro 14 Especifique No sabe/sin razon 15
508	¿Ha usado algún otro método o ha hecho algo después de usar (método 1°) para evitar un embarazo?	Si 1 No 2 (→ #512)
509	¿Qué método usó después de usar (método 1°)?	Píldora o Pastilla a DIU (IUD) b Inyecciones c NORPLANT d Métodos Vaginales (jaleas, espumas, cremas etc.) e Diafragma f Condón o Preservativo g Esterilización Femenina o Ligadura h Vasectomía i Método de Billings (abstinencia) j Ritmo k Retiro l No sabe m Otro: n especifique

510	¿Dónde consiguió este método la primera vez?	Clínica 1 Hospital 2 Farmacia 3 El Paso 1 Ciudad Juárez 2 Otro en Texas 3 Otro en Chihuahua 4 Otro en USA 5 Otro en México 6 Otro 7
511	¿Cuál fue la razón principal por la que dejó de usar (método)?	Quedó embarazada 1 Quería quedar embarazada 2 El esposo/compañero desaprobaba 3 Efectos secundarios 4 Le preocupaba su salud 5 Difícil acceso/disponibilidad 6 Quería un método más efectivo 7 Inconveniencia al usarlo 8 Relaciones esporádicas 9 Costos 10 Dificultad para quedar embarazada/menopausia 11 Fatalismo 12 Divorcio/separación 13 Otro 14 Especifique No sabe/sin razon 15
	Ahora le voy a preguntar algunas cosas acerca del futuro.	
512	¿Quisiera tener otro hijo?	Si 1 No 2 No sabe 3 (➔ #514)
513	¿Cuánto tiempo quisiera esperar a partir de ahora antes de tener otro hijo?	Antes de dos años 1 Entre dos y tres años 2 Entre cuatro y cinco años 3 Mas de cinco años 4

514	¿Planea usted o su esposo/compañero usar algun método anticonceptivo?	Si	1
		No	2
			(➔ #516)
515	¿Cuál método planea usar?	Píldora o Pastilla	1
		DIU (IUD)	2
		Inyecciones	3
		NORPLANT	4
		Métodos Vaginales	5
		(jaleas, espumas, cremas etc.)	6
		Diafragma	7
		Condón o Preservativo	8
		Esterilización Femenina o Ligadura	9
		Vasectomía	10
		Método de Billings (abstinencia)	11
		Ritmo	12
		Retiro	13
		No sabe	14
		Otro:	15
		especifique	
516	¿Cuándo fue la última vez que alguien platicó con usted acerca de métodos anticonceptivos?	Mes / Año	
		No recuerda?	
		(Marque con una X si ella no recuerda)	
517	¿Quién fue esa persona?	Pariente	1
		Amiga	2
		Vecino	3
		Médico	4
		Enfermera	5
		Partera	6
		Farmacéutico	7
		Trabajador/a de la Clínica	8
518	¿Planea usted dar pecho al bebé que acaba de nacer?	Si	1
		No	2
			(➔ #520)
519	¿Hasta qué edad?	Meses / Años	

520	¿Por qué no?	Madre enferma/débil	1
		Niño/a enferma/débil	2
		Niño prematuro	3
		Problemas de los pezones/senos/o dolor	4
		Sin leche	5
		Madre trabajando	6
		Niño rechazó	7
		Madre tomando medicamento	8
		Otro	9
		Especifique	

Comentarios de la entrevistadora acerca de esta entrevista:

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